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# Manual Training Teaching as a Vocation

Frank M. Leavitt

DURING the last two or three years we have heard much regarding vocational guidance and the duty of the teacher to give it in some measure whenever and wherever conditions may warrant. We, therefore, may be interested in the topic of this paper because of our sense of responsibility to our pupils, or we may be interested in it because, being engaged in the vocation ourselves, we may wish to examine the possibilities which it offers to us as individuals.

It is, undoubtedly, true that the modern evolution of industry is affording fewer and fewer people "vocations" and is giving to an increasing large percentage of the world's workers merely "jobs." It is worthy of note, in passing, that the teaching of the manual arts is a genuine vocation. This is true because it demands, and will repay, continual study, and will permit of considerable progress for the individual. Another reason why manual-training teaching may be considered a vocation is that, in addition to enabling one to earn a living, it offers opportunity for a large measure of social service.

If approached from the point of view of our duty to our pupils what information or advice are we justified in giving them regarding the possibility of progress for the manual arts teachers? We can tell our pupils that it is comparatively easy to make a beginning in the teaching profession, if one is prepared to teach the manual arts, since the supply of such teachers does not equal the demand. We can tell them that there are clearly defined lines of progress marked out for the individual who makes such a beginning. We can tell them that it is possible to state with considerable certainty the kind of study necessary to entitle one to this advance, and to give information as to where or how this study may be pursued.

Only a few weeks ago a group of men, representing ten of the larger educational institutions which prepare men to teach the manual arts, drew up the following statement for distribution:

(1) There is a well-defined and insistent demand for trained teachers of the manual and industrial arts which, at the present time, greatly exceeds the total supply of such teachers from all sources. It is the common experience of all institutions training these teachers that they are unable to supply, or even to recommend candidates for many of the positions which they are called upon to fill. A considerable number of such positions go unfilled for a time or are given to men inadequately trained or even wholly without special preparation for such work.

(2) A careful examination of all available statistics will show that the salaries paid to manual-arts teachers are higher than those paid for other school work demanding an equal amount of preparation. In fact the records of one institution show that teachers graduating from the two-year course in the manual arts receive a higher average beginning salary than that received by the graduates of four-year courses in other departments of school work. While, from one point of view, this is a fact to be regretted, since thoro preparation for any teaching position is greatly to be desired, yet there is much promise in the present situation which makes it possible for energetic and ambitious young men to enter the teaching profession early and to work their way up while continuing their training, for the new work demands constant study and progress.

(3) Not only is the initial salary higher for manual-arts positions but the opportunities for advancement are exceedingly good. With the rapid extension of vocational education, under the stimulus of state aid, a great variety of positions are being created in which initiative, originality and hard work are demanded, but which are properly rewarded by rapid promotion.

(4) While any high-school graduate possessing the necessary personal aptitudes and characteristics will find the opportunity, as above stated, unusually good, the student from a good technical high school who has taken a liberal amount of mathematics and science will find himself especially well equipped to take up this work and to secure a good position as teacher of the manual and industrial arts in a high school.

(5) The need which is felt by most industrial schools for the services of teachers with considerable practical shop experience offers unusual advantages to young men who, after a fairly good school training, entered some skilled industry three or four years ago. In most of the institutions now training teachers of the manual arts, such practical shop men will find an opportunity for securing a good preparation for positions in the new industrial schools, and can be entirely confident that there will be a demand for their services after a relatively brief period of professional training.

While there are other things which we might say to our *pupils* to encourage them, let these be inferred from what I now say, regarding the profession, for our own encouragement.

In the first place, manual-training teaching will afford the individual a decent living and regular employment. While there is no danger that a manual-training teacher will die disgraced, according to Mr. Carnegie's notion, there is every probability that he will live to a good old age and be repaid, not alone in money

received, but in the expressions of satisfaction which his pupils make regarding the training he has given them.

The teaching of the mechanic arts affords the instructor a chance to experience "The bliss of growth, the glory of action, the splendor of beauty."

It demands growth, because constant advance is not only desirable but is actually forced upon the teacher, if he would retain his standing. It demands action, because the work consists not alone in contemplation of things as they are, but impels to concrete effort to make things better. It demands beauty, because there is an increasing necessity for the manual-training teacher to study and combine with his own work the principles of constructive design, to the end that all his work may be made in the highest sense more artistic.

Regarding opportunity which the manual-training teacher has for public service, I would call attention to the fact that our new interests in and efforts for the 75 per cent of the children who are getting the least out of our present free public school, are addressing themselves primarily to the constructive activities, the work which relates to things and to processes. While we hear many statements to the effect that industrial education is something radically different from manual training, we manual-training teachers know that the difference is one in degree rather than in kind and that, if the schools are to solve the problems which the demand for industrial education presents for solution, they must eventually come back to the manual-training work for the foundation of any subsequent training which is to be given. Since the industrial education movement has chiefly in mind the improvement of educational conditions for the least fortunate 75 per cent of our public-school children, I think it is clear that we manual-training teachers have an immense opportunity for giving genuine public service. This we can give by getting intelligently into line with the new order of things.

There is another feature of our work for which we should be devoutly thankful. It sometimes happens that the thing which duty compels us to do is that for which we are not by nature or interest well qualified, but most of us manual-training teachers will find in the newer forms of industrial education an opportunity for self-realization, that is, for the development, in ourselves, of the very qualities which give us the most genuine satisfaction. I refer to the ability to create and to construct and to deal with concrete problems of genuine public concern. It does not become necessary for us to suppress all our natural instincts. Rather, we are called upon to develop them to their fullest extent.

This marks a great contrast to the conditions under which manual-training teachers of 25 years ago had to work. While they were engaged to teach manual training, they had to be as much like other teachers as possible. They were graded by the same examinations as the teachers of the classics and were required to be as much like these teachers as possible. But the demand today is for the industrial-arts teacher who is *industrially inclined* and is not ashamed of it.

I am convinced that the worst criticism which we can make on our schools today, as seen from the standpoint of the appropriate education for the industrial classes, is that they are dominated by teachers who are convinced that intellectual excellence is to be measured chiefly by success in book work. Conspicuous success in this field of endeavor is not possible for many of the children in whom the new movement is primarily interested and it is our problem, as manual-training teachers, to show to the school authorities, and to the public that intellectual activity may manifest itself in other ways than in the writing or the reading of books. You and I, as manual-training teachers, have the opportunity of helping to hold good the balance between respect for knowledge about things and respect for the ability to do things.

It cannot be doubted that our public-school system is under the most severe criticism at the present time. We hear on all sides that it is a failure. This position of course is not defensible. It is true, however, that far too many children are allowed to fail in our public schools. I believe that one reason for the failure of certain types of children is that the teachers are so constituted by nature, and so trained in the schools, that they are out of sympathy with the concrete-minded children. In my opinion one of the greatest services that we manual-training teachers can render is to offer the necessary encouragement to children of this type, who are frequently not inferior in intelligence, but are simply different in the kind of intelligence which they possess. Lacking this encouragement the children become self-conscious, sensitive to failure and finally discouraged. They learn how to fail. Instead of this we must teach them how to succeed.

"Self-distrust is the cause of most of our failures. In the assurance of strength there is strength, and they are the weakest, however strong, who have no faith in themselves or their powers." If the *strong* become weak thru self-distrust, what of those who have never achieved?

We should not overlook the fact that the scholastic ideals still persist in education. Today the business of the public schools should be, not merely to turn out pupils possessing the philosophic mind, those who find their greatest happiness in contemplation and in mental exercises and accomplishment, but as well those who revel in physical action and in the accomplishment of concrete material results. I suppose it is not necessary to maintain that such results are not to be obtained without some exercise of real intelligence.

It is for us, while other teachers are depicting the joys of contemplation and of literary analysis and construction, to demonstrate the joy in work of a more material nature, remembering that of the workers it was said, "they will maintain the fabric of the world; and in the handiwork of their craft is their prayer."

If we, as manual-training teachers, can show to the future industrial workers in this industrial state of our industrial country, something of this vision of the contented and efficient "artificers and workmasters," who can deny that our profession is a genuine vocation?

# ELEMENTARY MECHANISMS

Ray F. Kuns, Cincinnati, O.

AFTER the double time allotment to manual training (3 hours per week) had been in operation for some time in Cincinnati, it was the writer's privilege to come to the Oyler School as instructor in this subject. Up to this time practically nothing had been done with any materials other than wood. In spite of the fact that boys were allowed to select their own models, interest in woodworking seemed rather perfunctory, manual training and woodwork being synonymous terms to the boys. In selecting models to make, it did not occur to them to express themselves in any materials other than wood. A request on the part of the director of industrial arts, to break away from a formal set course devoted exclusively to woodworking and to find these things in which a boy is really interested, has resulted in the work to be described under the above heading.

The fact was realized that the formal interest which the average grade boy has in such small cabinet pieces as medicine chests, umbrella racks, taborets, etc., does not lead to real self expression in constructive building. There is never that heart-thrilling anticipation of how the piece will work when it is finished, such as comes to the builder of toys, engines, motors, sleds, coasters, wagons, etc.

The desire for action is a keen force in the life of every boy. Even tho the boy may have no desire to build a steam engine of his own, the instant some other boy has finished one and has attached it to the boiler, he is on the job with every other boy in the shop to see the test. Once the engine is running, he will stay with the builder by the hour watching it start and stop, testing its power with numerous contrivances, so entirely engrossed with the motion that all thought of his own footstool, book rack, or magazine rack is gone.

This passion for motion is part of the makeup of every normal American boy. After numerous conferences with the boys of the Oyler Shop this was found to be the case with them. By means of these conferences which covered at least eight weeks, before any definite steps were taken other than the regular woodworking, it was learned what things the boys were really interested in making. At first the suggestions were for models which might be constructed entirely from wood, but after being assured that they need not so limit themselves, the suggestions became more varied. A partial list of the suggestions would include the following: sleds, wagons, coasters, Irish mails, toy wagons and boats, electric motors, electric engines, wireless systems, steam engines and turbines, water wheels, etc.

Having the sentiment of the boys several problems of greater or lesser difficulties presented themselves. The supplies regularly furnished were entirely wood and woodworking accessories, as glue, nails, screws, etc. The equipment with the exception of a hand drill, two cold chisels and several files was entirely for woodworking. These facts were presented to the boys. Equipment must be secured and materials furnished. It was quickly decided that the boys must bring their own metal or reimburse those purchasing for them. Excepting in the case of some soft metals this has been the rule.

The equipment for metal work has been partly furnished by the manual training department, and partly arranged and provided by the shop. A lathe, band saw and two-horsepower motor were part of the woodworking equipment. For metal working, a machinist's vise, an emery grinder, one pair tin snips, one soldering iron, one natural-gas hot plate as well as a hack-saw frame, hack-saw blades, files and drill bits have been furnished by the department. The shop has provided itself thus far with two drill presses, two anvils, two blowers, a natural-gas blowpipe with other plumbing, a steam boiler; it has mounted a grindstone, secured three additional soldering irons, taps and dies, a quantity of firebrick, numerous pulleys, hangers, belts, etc., incidental to the arranging of the equipment. Space will hardly permit of telling how all of this equipment has been secured. Much has been brought in and donated by the boys, as for instance, the boiler and one anvil. The Cincinnati Traction Company gave a 22" piece of new car track for another anvil; firebrick is donated by a local manufacturer, etc.

The educational value of inculcating resourcefulness in the boys has alone been far greater than the trifling intrinsic value of the pieces constructed. At the same time, these pieces serve the needs of the shop admirably, and encourage the boys in individual projects. The boys are always on the lookout for things of use to the shop and scarcely a day passes without a contribution from some one of them, which he has picked up in the street, at the dump, or around his home. The spirit of co-operation has meant much to the development of the Oyler Shop.

The problems appearing under the title, Elementary Mechanisms, are some which have met with success in the shop. As yet, however, this is an almost untouched field.

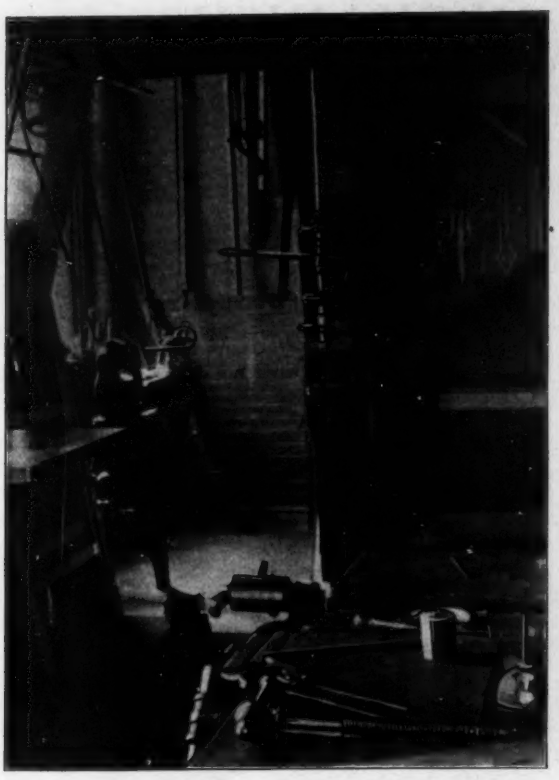
### Equipment.

*Anvils.*—While the regular blacksmith's anvil is to be preferred, its cost is often prohibitive. Short pieces of car track or railroad rails form very good anvils, if mounted on a block or some form of pedestal.

Heavy pieces of iron of whatever nature are often available and if properly mounted, form very serviceable anvils. The usefulness of the anvil is materially increased by drilling several holes of different sizes in the top face.

*Drill Presses.*—For elementary work in metal, weld-

*Note*—In this series of articles, Mr. Kuns will describe a new type of work which he is doing in an elementary school. Starting with the equipment usually found in a manual training shop, his boys have improvised and invented machinery and equipment with which to do work of various kinds in a variety of materials. To a mechanic accustomed to working with commercial machinery, the projects may appear somewhat crude, but when viewed as the product of the efforts of elementary school boys, they show hard work, planning and thinking, inspired by boyish enthusiasm and interest. The work is very suggestive.—*The Editors.*



Power Drill Press in Use in Oyler Shop.

Improvised Drill Press in Oyler Shop.

ing is usually too great a problem. Most necessary joints, however, can be made by the use of the drill press and rivets. This may not be quite as neat or quite so good as welding, but this fact need not prevent the worker from carrying out his ideas. The drill press takes a place alongside of soldering in all elementary work. It is almost useless to attempt any considerable amount of metal work without one at hand. A good hand or breast drill will take its place but these are not nearly so satisfactory and are much harder on the drill bits.

The drill press is a fine project and several models are shown which can be worked out in any grade shop. These models are not given with the idea only that they be copied without any variation, but that ideas for the use of materials at hand be supplied as well. In building a tool of this nature the first thing to do is to gather together all the parts available which might be used, such as gear wheels, pulleys, shafts, chucks, etc. Carefully consider each piece and how it might work in with other pieces to give the desired result. Once the plan has been decided on the parts may be assigned to different boys or groups of boys for getting out and working up.

**Power Drill Press.**

The wood used for the frame and all parts which require wood should be a good hard wood such as maple or oak altho most any sound wood will do. If the press is to be driven as suggested in the drawing, the height of the line shaft will have to be considered in getting out the back. Work this to size and if a plow is at hand cut a groove at each edge at the back face to take the end of the iron brackets which hold the table in position. This will permit of the table's being raised and lowered without the irons striking the wall when the press is fastened to it. In case no plow or rabbet plane is at hand the back may have strips fastened to it to bring it out from the wall the necessary distance.

*Supports.*—Work out the pieces which contain the bearings and support the shaft. Fasten these in place using ⅜″ by 5″ lag screws, running them in from the back.

*Table.*—Work this out and assemble the pieces. Run a lag screw into the lower part of the brace from the back. When the head of this is cut off, it will fit

Anvils in Use in the Oyler Shop.

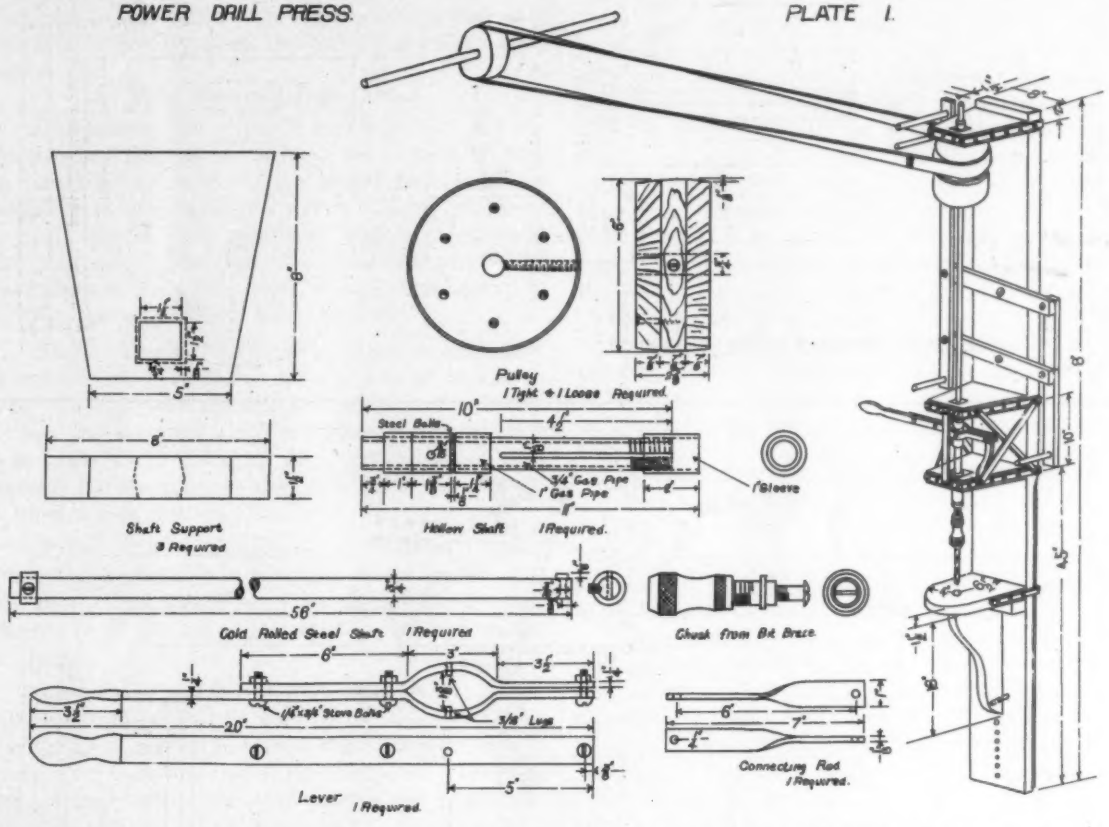
into the holes which should be bored into the back of the frame to give the adjustable feature.

*Brackets.*—These are the same as those shown on Plate 2. Work these out and fasten them in position seeing that they are not too close a fit to prevent the table's moving freely.

*Shaft.*—The ¾" shaft should be made from cold rolled steel and be long enough to allow a pulley's being placed on it level with the line shaft. This pulley should be of a size to drive the shaft of the drill press about 600 revolutions per minute. Above this pulley should be placed a loose pulley of the same size. The lower end of the shaft has a 3-16" hole drilled thru it and a skate balls serve well for this purpose. These are held in position by means of a sheet-iron sleeve slipped over them. This sleeve, which is not shown, should be a close fit over the collars and should be soldered at the joint to keep it from spreading. Two holes matching those in the loose collar should be provided. While this form of bearing is not absolutely necessary it will make an easier running machine as well as adding materially to the life of it.

*Chuck.*—This is taken from the ordinary carpenter's brace. Several holes should be bored in the large part of this and a spanner wrench made to turn it tight, especially if the round or straight shanked bits are to

POWER DRILL PRESS. PLATE I.




lug fastened to it. This lug fits in the slot in the hollow shaft, and serves to make the two parts turn together. A collar, on the upper end, keeps the shaft in position.

*Hollow Shaft.*—This is a piece of gas pipe having the chuck fastened in it, at one end, and the collars for the lever at the other. Cut the slot in with the hack saw. This permits the necessary vertical motion of the chuck. The three rings or collars of 1" gas pipe should be cut to size with the hack saw and squared up with the file. The top and bottom ones are riveted to the hollow shaft while the middle one is left free to permit of fastening the lever to it. This one has two 3-16" holes drilled in it to allow for this. The ⅛" space between the two lower collars is left for placing in the steel balls which form the ball bearing. The ordinary roller be used. Straight bits will need to have the end ground to a taper so as to fit the jaws of the chuck.

*Bearings.*—Place assembled shaft in position in the frame having a piece of 1" gas pipe 1½" long on the hollow shaft over the slot. Babbitt the ¾" shaft in the two upper supports and the piece of gas pipe in the lower support.

*Attaching Chuck.*—This is a very important operation. Once the shaft has been placed in position the chuck may be placed in its position in the sleeve on the end of the hollow shaft. It should be fastened temporarily until it is found by testing that it turns true. When its proper position is determined, it may be fastened by running melted babbitt metal into the sleeve around it.

PLATE 2

HAND POWER DRILL PRESS

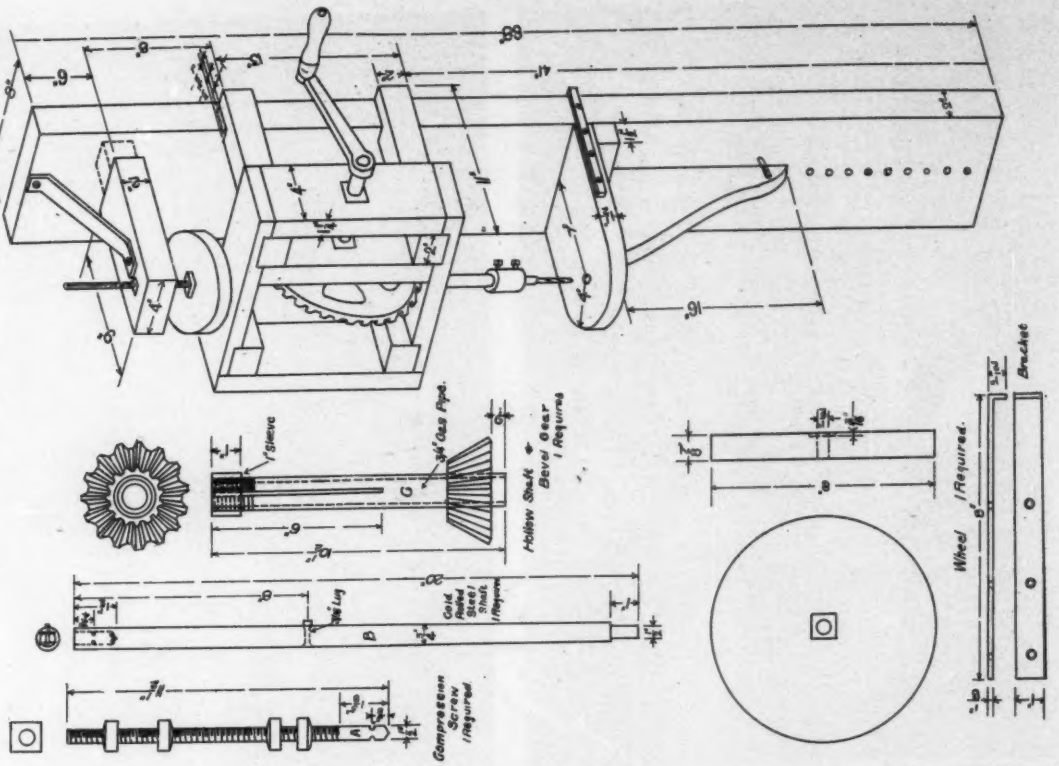
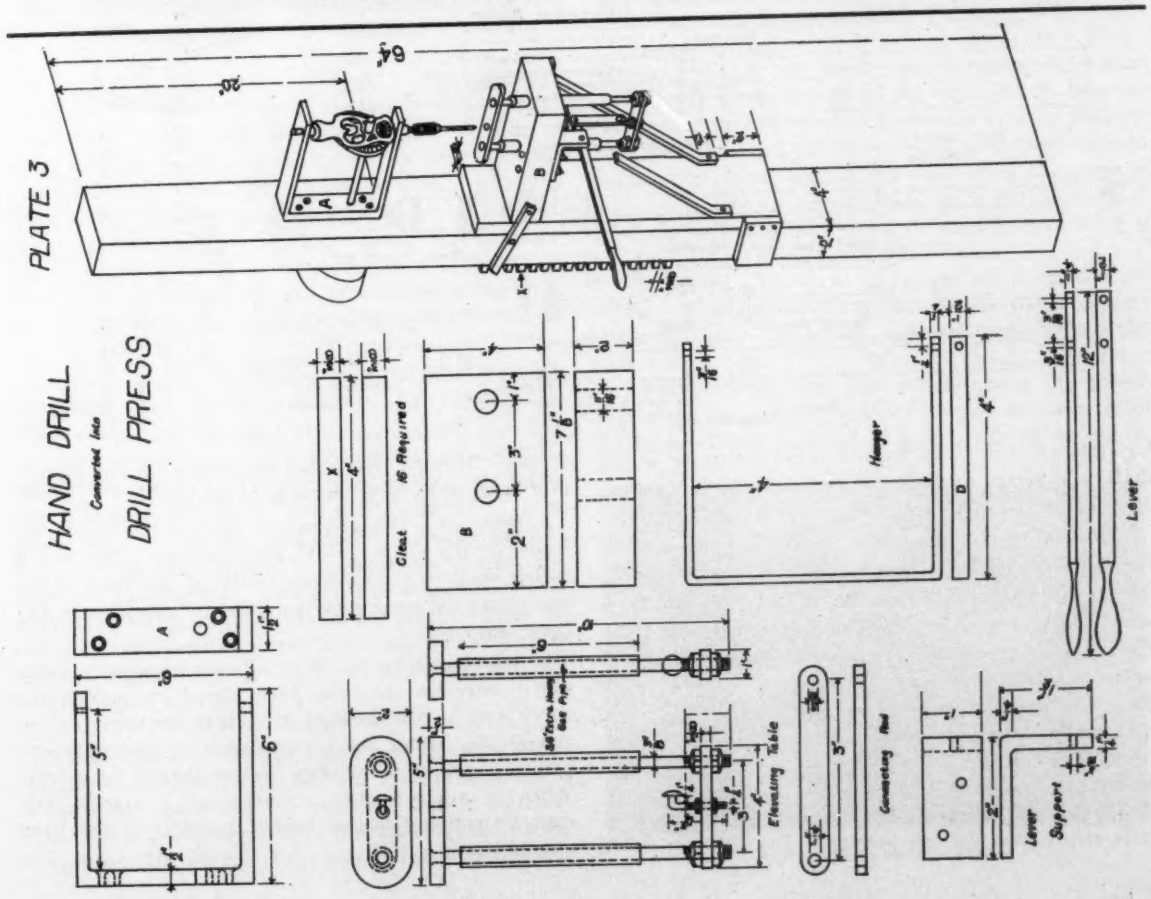



PLATE 3

HAND DRILL Converted into DRILL PRESS



*Lever.*—The drawing makes the construction of this plain. After the press is once in operation the weight of the lever should be counterbalanced by means of a cord run over a pulley, having one end attached to the lever and a weight attached to the other end.

*Braces.*—If no other means are at hand the braces may now be worked out and drilled on the press itself after which they can be fastened in position on it.

*Pulleys.*—If no iron pulleys are at hand, wood pulleys such as the one shown in the drawing are easily made even without a lathe. Lay off three ⅞″ boards to the proper diameter and after cutting to size and boring the hole in the center they can be assembled on the shaft using glue and screws. By clamping a tool rest close to them as they are turning on the shaft they can then be trued up perfectly and given the necessary crown.

**Hand Operated Drill Press.**

The construction of this is shown in Plate 2. The frame is the first part to get out but it must be built in a certain measure to suit the beveled gears which are necessary to a press of this nature. These can be of any suitable size which may be at hand or picked up at the junk shop. The shaft should make three or four revolutions to one of the crank, so care must be used in securing the cog wheels or beveled gears.

*Shaft.*—This is fairly simple. Care must be used in drilling the hole in the upper end so as to have it true. Two ⅛″ holes are drilled thru the shaft as shown to take the two pins which are used to hold the part A in position. In fitting up these parts allowance must be made for placing some steel balls under the point of A when it is in position.

*Hollow Shaft.*—Care should be used in working this out and especially in fastening on the smaller beveled gear. This should be so placed that it will mesh properly with the large gear which is fastened on the crankshaft.

*Compression Shaft.*—If cold-rolled steel is available, it should be used in working out this part. The lower end can readily be worked out by hand if care is used. Four nuts are needed for this part. The lower two are used to lock the small wood wheel in position on it, while the others are imbedded in the wood brace which it passes thru, one being placed on each side.

*Bearings.*—These are all made of babbitt run in square holes cut in the frame. This is the same method shown in Plate 1.

*Chuck.*—This is a metal sleeve having several set screws in it. One screw fastens it to the shaft, while the other is used to hold the drill bits in position. This will only take bits having ½″ round shanks. However, this is the form of chuck in most common use on ordinary drill presses. If it is desired to make one of these a piece of ½″ extra heavy gas pipe 2″ long will serve very well. One-half inch from each end a hole should be drilled and tapped for ⅜″ set screws. The brace chuck can be used instead of this, however, or the shaft may have a hole drilled in the end of it and forged square over the end of a square shanked bit. In the latter case a set screw should be arranged for, to keep the bits from dropping out, but this is not absolutely necessary.

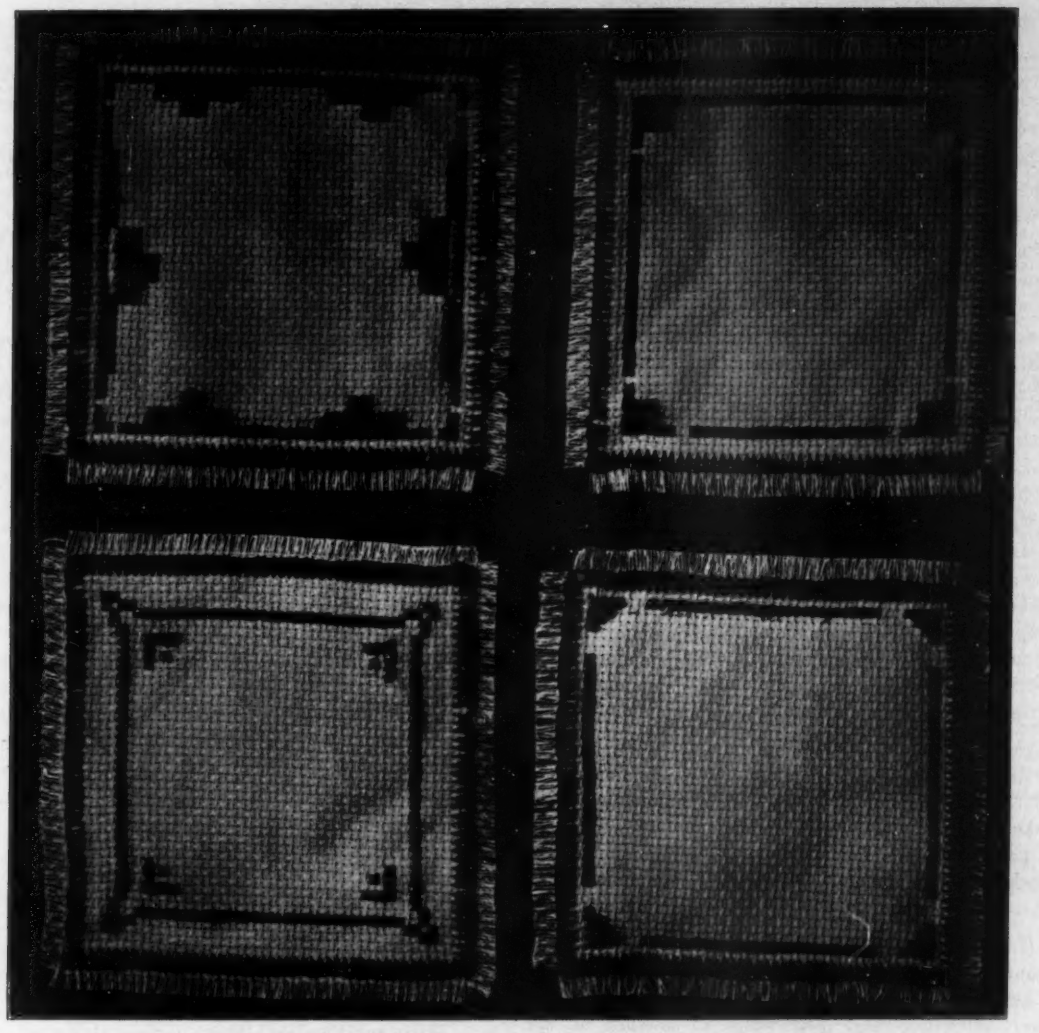
*Fly Wheel.*—To make a press of this nature work well, it should have a fly wheel to keep the power steady and make the work easier. The simplest method of arranging a fly wheel would be to fasten it on just back of the crank, or on the crank shaft between the bearings. It might even take the place of the crank having the handle fastened directly to it. The usual method, however, of arranging the fly wheel is to place it on a separate shaft. This could be done quite easily on this press by fastening a large spur gear on the crank shaft and a smaller one on the fly wheel shaft which might be arranged with bearings on the upper set of 2″ by 2″ arms.

**Hand Drill Converted Into Drill Press.**

This may be used for power or the crank left on and used as a hand power press. In arranging the bracket to support the drill frame, care will have to be exercised in order to have it of the proper dimensions to fit the particular drill being used.

Little need be said about the construction as that is pretty clearly shown on the drawing. Inasmuch, however, as the drill is rigid, the table must be designed for raising the work against the bit. The pieces of gas pipe which pass thru the block b, will not need any other fastening, if they are a fairly close fit. No weight ever comes directly on them.

"To make a good living; to have a happy family; to make preparation for hard times; to wear overalls in the shop with the same dignity as good clothes are worn on Sunday; to be confident that you are laying a sure foundation for any future success; to feel that you are master of your work; and that you share the creative spirit—this is the philosophy of learning a trade."—*Milton P. Higgins.*



Mats Designed and Cross-Stitched by Second Year Children.

# CROSS-STITCH EMBROIDERY ADAPTED TO SCHOOLROOM PROJECTS

**Martha Feller King**

STITCHING many little crosses on coarsely woven materials in strangely grotesque designs is one of the most elementary forms of needlework. Again and again it is revived from the dim past when our grandmothers, as children, toiled over samplers that pointed, in colored threads, the written morals of being a good girl.

Because the process is so simple, this form of embroidery adapts itself particularly well to constructive problems in the schoolroom. Children in the second year of school successfully design and develop their designs in cross-stitch embroidery with the greatest pleasure and little difficulty.

It is unwise to give young children work which is unduly taxing. Materials should be selected which eliminate eye-strain and the expenditure of much time and patience. Railroad canvas or burlap, embroidered with a coarse worsted yarn, and tilo matting, embroidered with raffia, are good.

The designs are planned first on quarter-inch squared manila paper,* with black crayon, the cross representing the stitch being drawn across the diagonals of each square.

Plan the paper eight inches square, cutting so that the edges follow exactly the outer edges of the enclosing rows of squares. This gives a length of 32 squares, representing an embroidery design of 32 stitches.

*The squared paper offered for sale by some school supply houses is ruled with a pale blue or light gray line, and should be avoided because of the strain upon the child's eyes. The same paper, ruled with a clear black line, is on the market at the same price, and should be used in preference to the others.

Cross-Stitch Embroidery Suggests a Means of Correlation between Problems in Design and Sewing.

The mats may be cut five inches square, and finished at the edges with a blanket or buttonhole stitch. The child should keep his design before him, on his desk, and stitch as designated by the crosses he has drawn.

Pencil cases, school bags, needle-book covers and cushion covers may be developed from these materials by third and fourth-year children.

An excellent opportunity presents itself here for community work in dyeing the yarns and materials used. Vegetable colors are fascinating in their variety and softness of hues. Cochineal gives a beautiful scarlet; logwood, or the husks of walnuts or butternuts, wonderful browns; cranberries a soft rose; saffron a deep yellow; pokeberries a red violet; purple cabbage or grapeskins a violet; while indigo gives a soft blue. Beautiful effects and different colors may be secured by mixing and combining the ones mentioned.

A mordant of salt or alum should be used to set the colors, and the materials should be carefully rinsed before being dried.

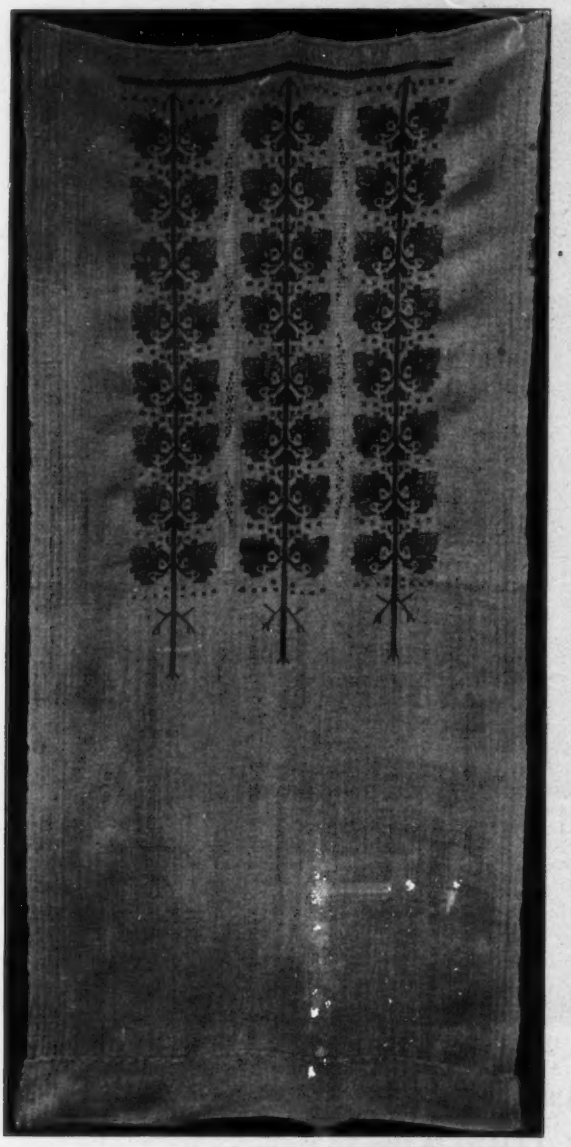
Community work in dyeing the required materials, planned with groups of from six to eight of the upper-grade girls, proves not only profitable, but intensely interesting. Two tin dish-pans, purchased from the five-and-ten-cent store, and a gas burner proved sufficient, in one school system, to supply necessary materials for seventeen classes, averaging forty students. The beauty of the completed work well repaid them for their time and the extra effort expended.

While cross-stitch embroidery is a possibility for producing beauty in projects suited to primary grades, its adaptibility does not stop there. It constantly suggests new designs and novel uses to which these designs may be adapted. As an application of the surface repeats developed in the design class, it suggests the decoration of hand bags, canvas music rolls, book and magazine covers and cushion tops. Its possibilities in developing problems in color harmony are practically unlimited.

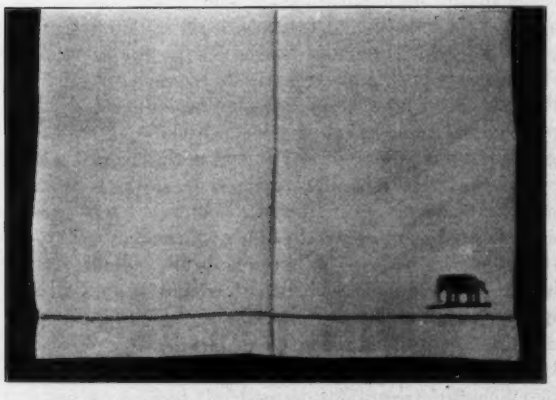
As a correlation to the work outlined in the course in sewing, seventh and eighth-year students, and even those in the high school, may apply this form of embroidery to household linens, furnishings for the nursery, clothes for the littles ones and even for themselves.

To any one familiar with the cross-stitch and the running stitch often used in combination with it, their possibilities and decorative value, especially on children's garments, are apparent. For instance, on any simple dress for a child the elephant or one of the other animals interesting to children, would be very pretty embroidered on the points of the turndown collar, on the cuffs and the belt. Lingerie acquires an added value in the child's eyes if each little garment is embroidered in cross-stitch with a favorite flower.

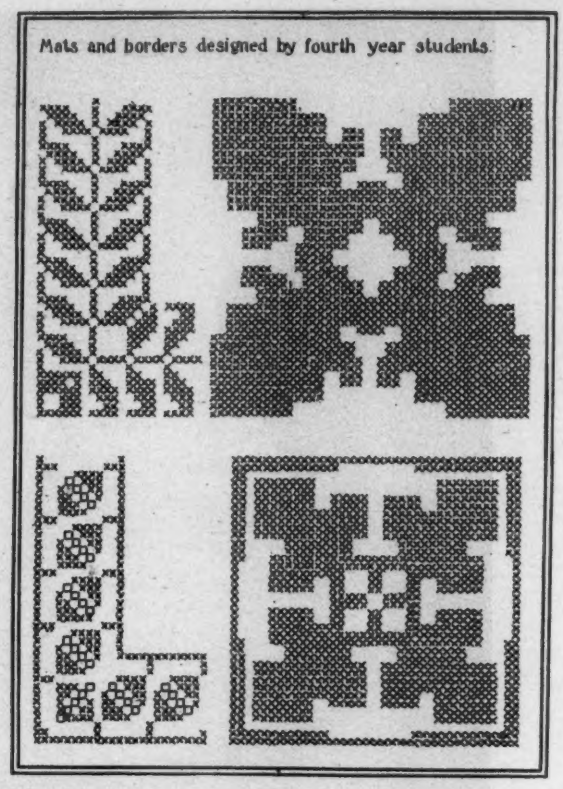
To cross-stitch the finer materials, as well as the linens and crashes, a special sort of canvas, which is sold by all needle-work shops, is used. It is a coarse net and is basted over the portion of the material to be em-

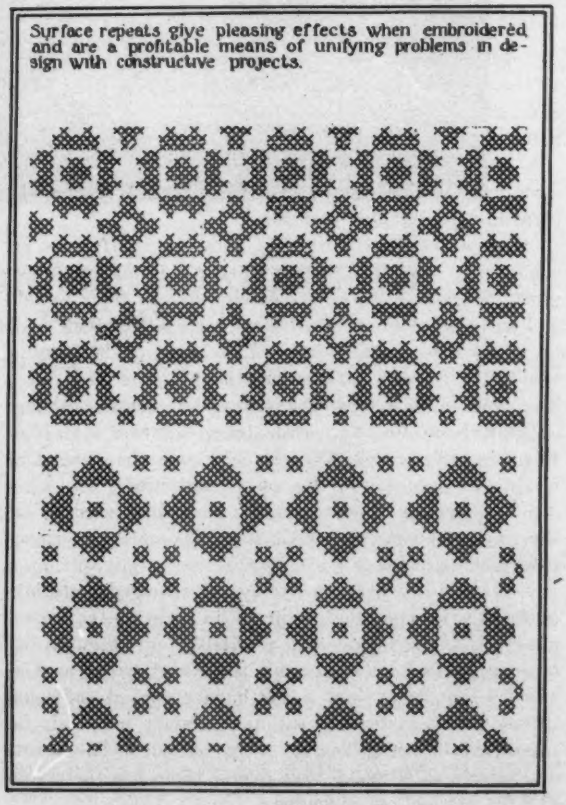


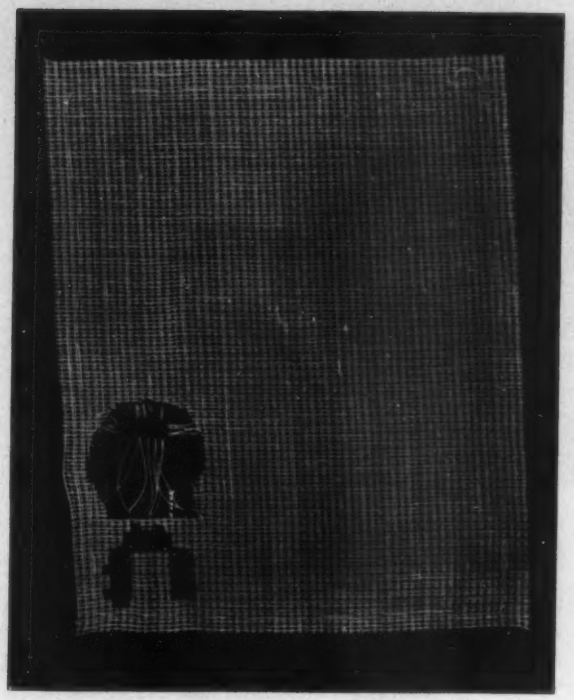
An Application, in Cross-Stitch Embroidery, of a Complicated Design derived from Plant Form.



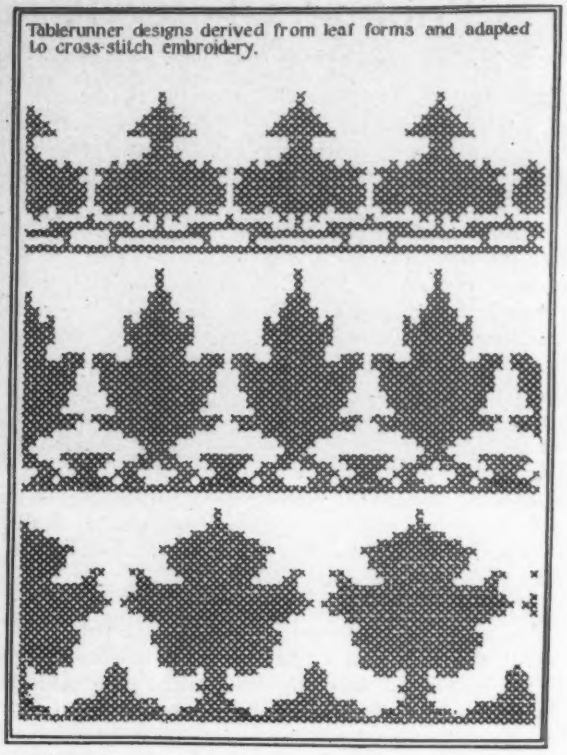
The Elephant, Embroidered on a Tiny Garment, would give it added Value in the Eyes of any Child.





Surface repeats give pleasing effects when embroidered and are a profitable means of unifying problems in design with constructive projects.

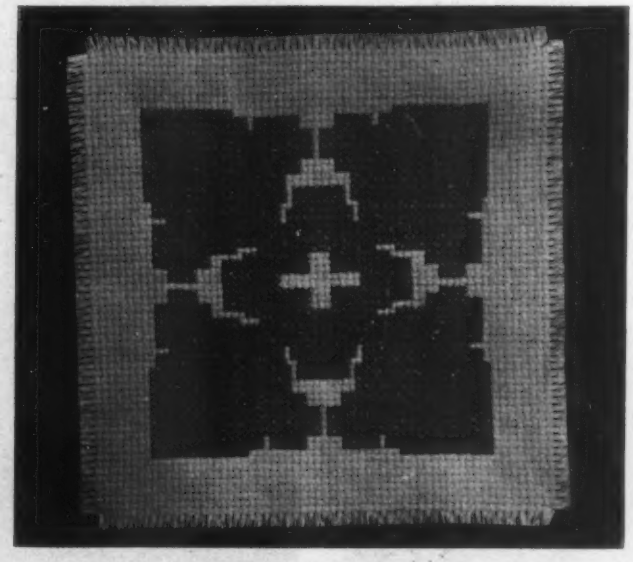


A Special Canvas is Used for Cross-Stitching the Finer Materials.



Tablerunner designs derived from leaf forms and adapted to cross-stitch embroidery.

broidered. The stitches are taken thru the canvas into the material beneath. When the embroidery is completed, the canvas is raveled and the threads pulled from beneath the stitches. This canvas ranges from number one, which is of a coarse mesh, to number eight, in which the threads are very fine. By using canvas of different meshes, the size of the stitch can be regulated without straining the eyes.



Mat Designed by Fourth Year Student from a Leaf Motif developed by Paper Folding and Cutting.

# Printing a Forty-Page Magazine in a School

**Ralph A. Loomis, State Normal and Training School, Oswego, N. Y.**

THE publication, at regular intervals, of a magazine of approximately 40 pages, with the exclusive help of students who have had little experience is one of the common problems of the printing instructor.

After the material which is to go into the magazine has been collected and edited, the student printer steps in and carries the work thru the necessary processes to its completion. At the outset to make this more comprehensive the different steps are as follows: straight matter composition; advertising composition; proof reading; proof correcting; makeup of pages; imposition; cutting paper stock; preparing the press; make-ready; press feeding; cutting sheets after having been printed; folding sheets and covers; collating and assembling the books; binding them; trimming; slipping them into mailing envelopes; addressing; finally shipment, with information regarding the sending of mail at second-class rates.

All of the above steps, when completed by the students, give them a general insight into the publication of a magazine. It is all handwork but the knowledge of machines which lessen the labor in the great publishing houses in the large cities is discussed and illustrated whenever these machines are used to advantage.

In illustration No. 1 young men students are shown setting and distributing type, correcting proof and proof reading. The amount of application this work requires is almost inestimable. It means concentration of mind and complete absorption in the work at hand. There is no disciplining here no matter what age the student may be.

In type composition the worker is constantly being called upon to exercise rules of grammar and English. He soon becomes dependent upon the dictionary to settle uncertainties in division of words and capitalization. This contact with authority is bound to extend the student's vocabulary and in a few days after he has learned to read proof he will begin to notice mistakes in poor reading matter and will unconsciously be attracted to better and more accurately printed publications, in which high-class aspects are associated with high-class reading.

*Note*—Mr. Loomis, besides being a graduate of a technical school, is a practical printer with several years of experience in the trade —*The Editors.*

In illustration No. 2 young women students are shown correcting press proofs on the stone. Women are capable of being as successful in printing as the men.

The next step in the mechanical part of magazine building is the paging of the type. It takes a great deal of judgment and skill to properly separate, classify and arrange the material for a 40 page magazine. This is the work of students and in it they learn a great deal about the general rules for making magazine material. They also learn how to properly tie up type and handle it and how to number the pages. In illustration No. 3, the pages are shown for a 40 page magazine. The slips of paper, with page numbers marked on them, aid later in imposing the pages on the stone. In the foreground is shown the different cover page designs of "The Vocationist," our school magazine. The covers were arranged and set by students.

The next step is the imposition of the pages and the lock-up of them in the chase on the stone. This work requires considerable skill and absolute certainty of the manner in which it is done. As our pages are locked up in four-page forms the imposition of the pages is simple, but the stone man must know the correct pages to run together. We have found that it is quicker to arrange the pages so that each form of four pages backs itself by simply turning the sheets end for end. In this way considerable time is saved in make-ready and if the proper quick drying ink is used and the proper paper, the pages will not offset if the pages printed first are backed first. By this method and as the books are bound thru the edge of the back, the pages will be locked according to the following plan: 1 and 2 with 39 and 40, 3 and 4 with 37 and 38, and so on, working from front and back to the center. Of course, if it is not a 40 page book that is being printed the pages must number some multiple of four and then the first two and the last two be locked together and so on. These forms are simply turned and backed and then cut in two, making two sheets of four pages each.

Inasmuch as a 10″ by 15″ press is used in our plant we have been compelled to crowd the press to the limit in order that a good size page may be printed. Cut No. 4 shows the arrangement of the pages and

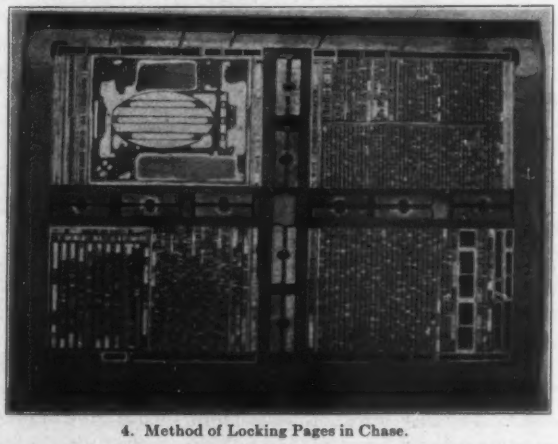
2. Printing, Correcting Press Proofs, Cutting.

1. Setting Type, Distributing Type, Correcting Proof, Proof Reading.

3. Type Tied Up in Pages Ready for Imposition. Cover Page Designs.

quoins. The placing of the quoins between the pages is necessary because it would be impossible to get the proper margins if quoins were placed outside as in larger forms. In locking pages this way it is advisable to use full length wood furniture across the narrow way of the chase and also full length pieces along sides of pages. Then, in locking, lock the short way of the chase first, which, with the long pieces will help hold the chase from springing out and bowing its long sides. Then tighten the other quoins only enough to hold type firmly.

If the stock cutting has not already been done the paper may now be cut. It is always better to conform



4. Method of Locking Pages in Chase.

While this method of lockup is necessary, under the conditions described by the author, it is considered unworkmanlike. In school shops and commercial establishments, it is not tolerated because it is unsafe and because accurate inside margins are impossible.

the page size of school publications to the regular stock size paper carried by the paper companies so that there will be little if any waste in the paper. However, it is always well to have a sheet large enough to trim after having been cut out of the large sheet.

As we arrange our book, the regular 25″ by 38″ sheet is quartered, making a sheet 12½″ by 19″, then by trimming ¼″ from the narrow margin and ½″ from the longer, we make an accurately cut sheet with perfectly true, clear edges, which will insure the possibility of a perfect register.

The press is now prepared. A full size, tough tympan sheet is tightly stretched over the platen, using only two sheets of press board underneath. As such a large form requires a heavy impression a small amount of material under the tympan must be used to prevent slurring. The screws under the platen are tightened up so that all the squeeze is exerted that is safe, so that the face of the type is not jammed. The rest of the make-ready is done with tissue paper. The make-ready, when cuts are part of the form, is much more difficult than when all type is used. In any case, when a proof is taken it very rarely shows a perfect impression. The impression screws are set so that no part is too heavy and then a proof is taken. Then by drawing lines around the spots which are too light and fitting tissue paper according to the lines as drawn, the impression is brought up even over the entire form. This work requires some experience and skill to be quickly and well done.

The operation of feeding the press requires great care. The sheets must be fed each one exactly to the pins so that when they are turned and backed they will register perfectly. When the backed-up pages are held to the light, if the running head lines and page folios back each other perfectly as well as the type of the pages, the register is perfect. If printing shows this quality it is good.

Illustration No. 2 shows a young man feeding the press and another cutting the sheets. After the sheets have been printed the next operation is to cut them. It is needless to say that the sheets must be jogged together perfectly so that in cutting they will all be straight and even. Then, also the sheets must be very tightly clamped in the cutter to prevent slipping. Folding the sheets is the next operation which, in this instance, takes but one fold. After all of the pages and covers are folded they must be collated or assembled into

5. Cutting, Collating, Folding, Binding.

books. Cut No. 5 shows the operations of cutting, folding, collating, and binding. By arranging the contents of the books in order, and slipping one section inside the next, the books are assembled. In this operation a close lookout is kept for imperfect specimens of printing, folding or cutting, and spoiled sheets are held out.

The binding and final trimming of the book are not difficult operations, yet they must be attended with care. The cutting especially must be well done or the books will be ruined. The final step is not very trying but the addressing of envelopes, when properly done, is educative. The last work gives instruction in postal regulations in regard to shipment at second-class rates. This is practical experience which would probably be brought to students in no other way.

This work in its entirety is the highest practical demonstration of cultural and mechanical training and develops the abilities as no other work could along these lines. Every school should print a small magazine. It will hold the students in school and be the means of showing them the practicability of all of their other subjects as well as adding a new money making department to the school and a new course to its curriculum.

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# Practical Suggestions From a Teacher-Manufacturer

E. H. Sheldon

I AM led by my observations to comment on an attitude which quite commonly prevails and which in this day and age of high efficiency, is an unfortunate attitude I believe for our educators to assume, that is, the indifference on the part of our teachers towards the high standard that any reasonably successful workman invariably assumes towards the condition of his tools. There is nothing which so quickly brings condemnation, particularly upon a cabinetmaker, as an indifference towards the condition of his tools. He is invariably a laggard and a "botcher". In my own teaching experience I have found that the average pupil equipped with one sharp chisel and one sharp plane blade over which he has sole jurisdiction will accomplish more real skillful work in less time than a half dozen pupils that are allowed to use any old tool under any condition. I have always preached the gospel of at least one individual plane blade and one or possibly two individual chisels. As any one of us will admit, the average pupil will require from 30 to 45 minutes to sharpen an average dull plane blade to a razor edge. That edge, therefore, represents actually this amount of value. In our factory our minimum wage to high-school pupils is 18½ cents per hour. In other words, if your pupil spends 30 minutes in sharpening a plane blade he has consumed nine cents in actual cash value. In other words, the boy has consumed in actual cash value a large per cent of the total value of the blade he is sharpening. The idea now that the value which he himself has put into that tool should not be of concern to him, is wasteful and utterly out of accord with our present ideas of conservation and efficiency.

When I started in business I was paying from eight to fourteen cents per pound for our tool steel. We pay now from seventy-five cents to one dollar per pound

without the slightest hesitancy. We could not be induced to go back to the old ten-cent product. We now recognize how quickly the added efficiency pays this difference in cost.

This brings us to a consideration of the point of view which will confront the school graduate when he leaves your school and gets his first job. He is confronted immediately with the doctrine of efficiency, he is given a time-ticket and the story he tells on that time-ticket at the end of each week is going to determine whether he belongs to the "beefsteak" or "corn-beef and cabbage" class. He will step immediately into a world of competition and his progress will be upward or downward, according to his ability to grasp the opportunities that come his way and make the best of them. He can count on it as a certainty that the competition he is to meet will have a sharp edge that is cutting direct to the line and cutting efficiently, that is being propelled by a force inspired by keen intelligence, that is not only working on the job continuously but every phase of it.

Speaking now from the standpoint of an employer, the one who is called to pay for the talent which you are creating in your schoolroom, I should like to lay stress on the good old adage, "Better be sure than sorry." There is nothing so utterly discouraging from the manufacturer's point of view as the individual who will roll away from his machine a truck loaded with table legs mortised on the wrong side, castings drilled off center, bills invoiced improperly, material checked out wrong—in other words, the individual who allows mistakes to pass by him because he has not acquired the habit or does not realize the importance of verifying.

For example, in my early days as a pupil I approached the assembling of a mortised and tenoned joint where I was not allowed the privilege of continuous cutting and trying, with many doubts and misgivings. However, thanks to George Richie's eternal hammering, I acquired the habit in laying out a piece of work of measuring twice before I made the line. I discovered that an inch was not a difficult space to measure and measure accurately, further that any tenon an inch wide, measured and cut accurately, would fit a mortise likewise measured and cut, that the verifying of the measurements at the right time and in the right place is a matter only of an instant's effort, that the correction of a piece of work mismeasured and miscut was a long and expensive process.

Thus it is in our factory processes. Show us a man whose inch is an inch, whose addition we know is correct, whose check we feel sure of, and his success is as certain as the business he is in. The guesser, however, is the paralysis not only of his own progress but that of the concern which employs him, and his name appears at the head of the list when we begin to lay off men. If we feel for any reason that he ought to stay on the payroll, the foremen begin to quarrel and draw lots amongst themselves to see who the one shall be that will be burdened with him. He becomes absolutely a pitiable object that should hang in effigy in the classroom of every Manual Training shop, where above all places, is the opportunity to acquire the habits of accuracy, forethought, initiative, and verification. It has been my observation further that the habit of analysis is one which is extremely valuable to the young man who is confronted with the actual problems of business life. In other words, if a pupil can be induced to analyze what he is doing, why he is doing it and when is the best time to be doing the particular thing in hand his success is assured. To illustrate: I am a workman mortising table legs. What are the mortises for? To support the cross rails of the table. What is going into these mortises? The tenons of the cross rails. Are the mortises I am cutting going to fit these tenons and bring the cross rail into the position where it must be to make a table? Common reasoning prompts me to try a tenon to see whether it fits. Lo! It does not fit. I have therefore an opportunity to make the correction before I spoil the balance of this truck load of material. Doubtless to those outside of actual factory practice, such a line of logic sounds silly. I will state, however, that the individual that can be relied upon in a factory to indulge in such silliness stands in great danger of being made foreman of the department he is in, and in a comparatively short time of becoming superintendent and eventually an owner. So, if a pupil for any reason wishes to keep out of the class of superintendents and owners, let him continue to cut a mortise and tenon and then be surprised to find that it does not come in the right place, and does not fit.

The analyzer with any kind of intelligence back of him is almost certain to be traveling along the lines of improvement. We often find ourselves doing things in actual office and factory practice which are inconsistent, expensive and illogical simply because it is the way we have always done it. The individuals who can shake themselves loose from precedent and base their acts on reason are the ones who are making improvements in the world. Therefore, the value to the beginning pupil lies in his ability to get the reasoning point of view and attitude towards the work he is doing. The professional systematizers who are now being welcomed in the majority of progressive business institutions thruout the country, almost invariably find the strongest kind of opposition to their plans on the part of the old-timer who has accustomed himself to one kind of operation and thought, who will without the slightest hesitancy declare that a thing cannot be done in that way and back it up with the illogical reason that it cannot be done because it never has been done that way, feeling that that is argument enough. They are, and have been, willing to expend useless energy, time and material in a round-about-way, because that is the way it has always been done.

Finally, there can be no doubt that the wonderful progress that has been made in recent years mechanically, scientifically and commercially, is due to the technical training that has, during this period, made such headway. As the present Manual Training school and your own classroom are now pretty nearly the foundation of this training, I believe it behooves us to look carefully to the standards we are setting.

Dressmaking Room, Girls' Vocational School, Kalamazoo, Mich.

# A VOCATIONAL SCHOOL FOR GIRLS

**Ida L. Schaffer, Director Girls' Vocational School, Kalamazoo, Mich.**

KALAMAZOO, Mich., has been noted for many industries, its name, its people and its educational advantages—also for its progressive spirit in beginning and advancing new ideas. Special work of one kind and another has been offered in the public schools for many years. And when in 1911, Miss Charlotte Waite came back to her former home, after teaching and studying in the East, she brought with her the enthusiasm of one who has seen, and has been closely connected with, the Industrial Education movement. In the month of February, 1912, after six months of investigating the conditions in and around Kalamazoo, she started the first vocational school for girls in Michigan.

During the first month, 21 girls were enrolled. The school was located in one room of the Vine Street School, where there were sewing tables and recitation desks, in which the students alternated their sewing and academic work with a few special subjects. As the numbers grew, as they have to 61, more rooms were necessary, so that now in the Vine Street Building three rooms are used; a general assembly room, which is also used for the academic work, a dressmaking room, and a music room. Rooms for sewing, millinery, fine needlework, art, laundry and cooking are located in the new Manual-Training Building, which almost joins the Vine Street Building. The new gymnasium also close by affords the girls accommodations for their swimming and gymnastic exercises.

What has drawn girls to this school? Some have come because they wished more practical work, others because they did not care for high school—others because their parents wished for them this training and still others because they wished first of all to fit themselves for a useful and wage-earning life in some trade. One of the school's main reasons for existence is to reach certain girls and give them something which will be useful to them in the present and in the future. The knowledge of the work which the girls receive does away with the long period of apprenticeship with which they would otherwise have to contend and without the chance of further schooling.

Lately there has been the cry that we are "jumping from the academic extreme to the vocational extreme

Cooking Room.

Millinery Room.

and we forget that the real purpose of education is the development and discipline of the intellectual and moral faculties." To avoid this other extreme and to supplement the vocational training we have both the vocational subjects and the academic work which broadens their outlook on life; and gives them a wider experience with which they are better able to meet the problems which will daily confront them. Another reason for the school's existence is to interest the girl who is altogether too young to enter upon the full responsibility of a wage-earner and who without this type of school would enter upon some task which would be a monotonous grind and not a stepping stone to higher positions. Even if a girl does not enter a trade after completing our course, she is a more useful and a more accomplished helper to the tired mother or sister at home or as a housekeeper, than if she had wasted or dallied thru two years of regular school, for which she did not care.

To enter the vocational school, girls must be 14, or must have finished the eighth grade, therefore, a few younger than 14 have enrolled. The homes from whence they come are of all different types, for according to the registered slip the fathers work in 47 different occupations. There are two machinists, two firemen, three farmers, two carpenters, two contractors and two tailors, which as you see are duplicates; three fathers are retired and three mothers attend to their own homes.

All girls should have finished the eighth grade—but often trouble comes during that grade and so no graduation. Perhaps the girl needs a different interest than the regular routine work, so if the school finds it worth while, then the girl is allowed to enter without a diploma. We have seventeen that have been allowed to enter within this condition. The other group, 43 in number has members who have finished the eighth grade and many who have gone beyond the ninth and tenth grades. The ages of the girls which are always computed from Sept. 1, are as follows:

1—11 years.
2—13 years.
29—14 years.
21—15 years.
5—16 years.
1—17 years.
1—18 years.

Very little outside school work is expected of the students. All subjects in the course of study are at present required except swimming. The course is somewhat flexible so that the girl will learn thru experience rather than by models. The arithmetic, history, spelling, English, business methods and textiles are all closely connected with the commercial and industrial aspect. For instance, the dictation lesson might be the previous lesson in different kinds of seams and their uses; the spelling often consists of terms used in sewing; the arithmetic problems deal with ribbon by yards, material cost and profit; cost of equipment for a shop or perhaps a problem in drafting is the means of a review in fractions.

The sewing gradually unfolds the fundamentals by means of sewing an outfit, underwear and children's clothes. The fine needlework, so far, has been working out embroidery and fancy stitches on collars, cuffs, vests and baby dresses. Dressmaking and millinery have for their problems, dresses and hats as the names imply, with the little accessories which accompany them. The laundry work treats with stains, pure material and tests, as well as the usual problems of the laundry.

Art is needed for designs in costume, hats, underwear, children's clothes and household furnishings. The purpose of the design for the first semester is to develop a working knowledge of principles of design, as a guide in selection, adaptation in dressmaking, millinery, personal and household articles. The second semester deals with the study of the human figure, adult and child, with a model figure to work from, then free drawings from fashion books taking the head as the unit of measurement and not trying to draw features (use of cut-out hands, face, etc., from magazines) then the study of color in pigments and materials. Costume illustration for the third semester includes sketches of real gowns in color, study of the head preliminary to hat trimming, costume designing correlated with sewing and millinery—original work, drawing from posed figures. House decoration is the fourth semester problem with the principles of purpose, order, simplicity. The rest

Specimens of Designs for Dresses Made by Students of the Kalamazoo Vocational School.

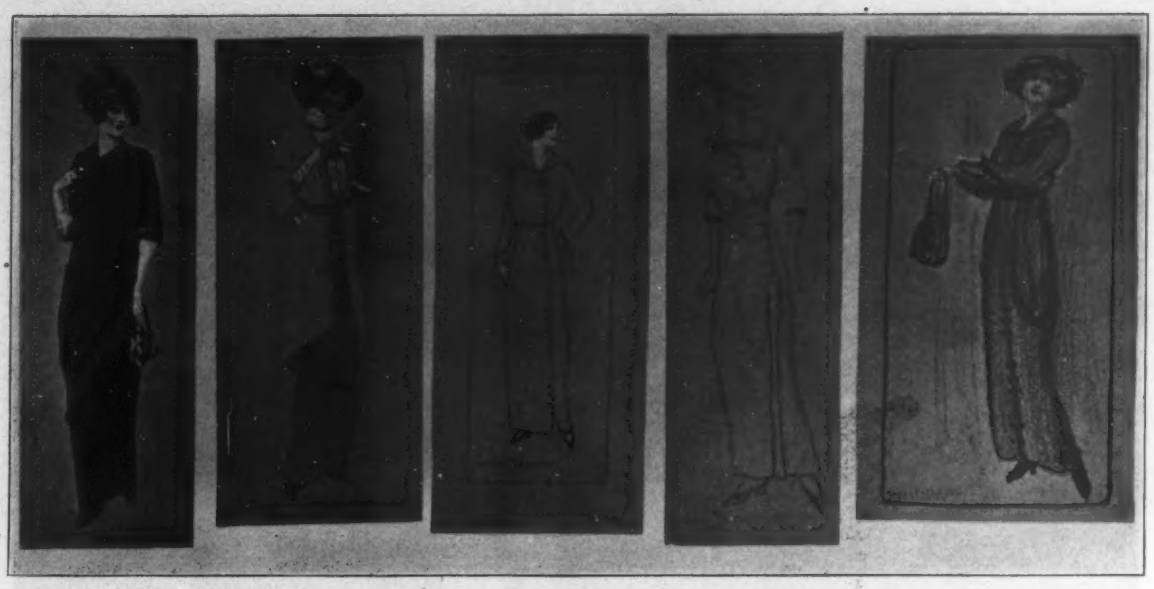
rooms in the new high-school building are an excellent theme upon which to carry out ideas. Cooking has its due influence on the girls because there they learn to make appetizing dishes out of left overs, plan meals, give attractive luncheons to guests, find the food value of certain dishes and emphasize the necessity of clean and pure food. When there are school parties the cooking classes plan and prepare the refreshments.

The equipment of the rooms is very good, indeed, considering the short time in which the school has been going; and part can be seen in the accompanying photographs. For the four vocational teachers there are eleven large sewing tables, one desk table, three folding tables, thirteen machines, one power machine, one cupboard, two closets, one set of drawers, one chiffonier and two drawers in each table for supplies and for girls' articles besides a stock room for extras used occasionally, and a large closet for millinery supplies, besides which each teacher has a desk for her own immediate needs. The city supervisors of art, music, gym, and cooking, have their own special equipment which the girls use, as they have these teachers for their special subjects.

The program for each section showing the amount of time, per subject, is as follows; the first section is the advanced class:

| Sect. I. | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| 9:00-10:20 | Dressmaking | Dressmaking | Dressmaking | Cooking | Dressmaking |
| 10:20-11:45 | Academic | Laundry Work | Academic | Dressmaking | Academic |
| 1:15- 2:30 | Millinery | Dressmaking | Dressmaking | Dressmaking | Dressmaking |
| 2:30- 3:45 | Millinery | Music—2:45 | Millinery | Gymnasium | Art |
| Sect. II. | | | | | |
| 9:00-10:20 | Academic | Academic | Academic | Dressmaking | Academic |
| 10:20-11:45 | Dressmaking | Dressmaking | Dressmaking | Dressmaking | Art |
| 1:15- 2:30 | Dressmaking | Dressmaking | Millinery | Dressmaking | Millinery |
| 2:30- 3:45 | Cooking | Music—2:45 | Dressmaking | Gymnasium | Millinery |
| Sect. III | | | | | |
| 9:00-10:20 | Sewing | Fine Needle Work | Sewing | Millinery | Art |
| 10:20-11:45 | Sewing | Fine Needle Work | Sewing | Millinery | Cooking |
| 1:15- 2:30 | Academic | Academic | Academic | Sewing | Academic |
| 2:30- 3:45 | Sewing | Music—2:45 | Sewing | Gymnasium | Sewing |
| Sect. IV. | | | | | |
| 9:00-10:20 | Sewing | Sewing | Sewing | Art | Cooking (b) |
| 10:20-11:45 | Sewing | Sewing | Sewing | Sewing | Sewing |
| 1:15- 2:30 | Sewing | Sewing | Sewing | Academic | Sewing (a) |
| 2:30- 3:45 | Academic | Music—2:45 | Academic | Gymnasium | Sewing |

There is swimming Monday, Tuesday and every other Thursday after school. "Order work" is required in the sewing and dressmaking classes, one-half of the time is reserved for it either by one-half number of days or by one-half number of hours in the week. For example, the advanced class of Section 1 has nine hours of sewing during the week, then four and one-half hours per week is given to "order work," which consists of



Specimens of Designs for Dresses Made by Students of the Kalamazoo Vocational School.

wearing apparel and accessories made for outsiders, for which a medium fee is charged. Orders for hats and fine needlework are also taken and filled. The trade element is here introduced and the pupils have more materials upon which to gain experience. Sometimes the article which is required is not wanted by the pupil so the necessary material is furnished by the school and the completed article is kept until sold to some customer.

The first class which completed a two years' course, finished this last February. Each girl made for the exercises her own outfit, consisting of dress and underwear, which were very inexpensive considering their attractiveness and suitability. These girls are now in dressmaking and millinery shops and excellent reports of their work were given just the other day by employers. All are busy, but two are not in business. One is busy making clothes for mother, sister and self and the other is not very well, but manages to sew for her family and for outsiders, attends the store when necessary and visits the school once a week.

We are attempting to follow up the girls who have left for one cause and another and see what they are doing for themselves. From reports all are leading busy and useful lives. Some return to visit and to attend social service, where activities of various kinds are held in three different centers.

So much for the past and present, but the future has its problems. One of these is the enlarging of the scope of the work—more subjects which can be specialized in, more individuals to be helped, more time for students who finish before they are 16, more teachers, and better accommodations. Who knows what the future has in store for us? Whatever it is may the school adapt itself to circumstances and help the individual as much as possible.

Specimens of Designs for Children's Dresses Made by Students of the Kalamazoo Vocational School.

© Cosmos Picture Co., N. Y. SCHOOL IN BRITTANY. Jean Geoffrey.

# SCHOOLROOM DECORATION

**Florence E. Goodenough, Assistant Supervisor of Art in the Public Schools, New York, N. Y.**

THE subject of Interior Decoration has become more and more looked upon as a vital, interesting and important phase of art study. Substantial courses are now offered in many schools and colleges in Interior Decoration. Many admirable publications have done much to promote an interest in and better understanding of the broad principles underlying the tasteful, artistic and harmonious decoration of our homes. Teachers and parents, as well as all school authorities are awakened to the splendid opportunities that present themselves for the attractive and inviting appearance of the schoolrooms.

The problem of schoolroom decoration has had less consideration and attention than that of our homes. While our school buildings offer much less opportunity for the employment of decoration than our homes, there are, nevertheless, many fine opportunities to apply here some of these principles with special application to the conditions that exist in the school.

The great obstacle that discourages many persons struggling with the problems of decorating the schoolroom on a small sum of money, is attempting too much in the number of articles introduced and too great a mixture of colors. The general tendency of the age is to simplify and to eliminate, and this holds true in schoolroom, as well as in house decoration. In the consideration of schoolroom decoration we may eliminate many points that present themselves in the home, for after all we are limited in this particular, to a tasteful and harmonious appearance of the walls and ceiling. We must create a feeling of spaciousness and harmony first. The happy selection of the wall coloring depends on such a number of associated details that it is necessary to consider carefully the form before determining upon any definite color tone. Due consideration must be given to all those seemingly unimportant factors going to make up the individual character of the room for which the wall color is to be chosen. The walls of rooms lighted by direct sunlight from numerous windows naturally take tones of blue and green in their darker shades. The reason for this is that these tones absorb light and do not reflect light as the yellow and pale red colors do. In rooms having plenty of strong sunlight the further reflection of light from the wall is not desired. Rooms not so favored with plenty of light and sunshine lend themselves better to colors which do reflect light, and therefore the reverse of the above is here necessary to be fol-

lowed. Many excellent authorities recommend all schoolrooms to be tinted some harmonious tint including the ceiling and each schoolroom offers a practical and interesting opportunity to apply a color scheme that will lend an atmosphere of refinement and restfulness.

We now come to the matter of pictures, sculpture, etc., and their selection and arrangement. Unless one has a single great picture for which a special place has been made, no picture should be hung to stay. The acquisition of a new picture or piece of sculpture will naturally necessitate the rehanging of all. Moreover, we outgrow some pictures we at one time thought beautiful, and we replace them or even prefer bare wall spaces instead. There are certain pictures which try our nerves on long acquaintance. No great picture affects our nerves in this way, for in great pictures there is always an element of repose. There is more or less temptation on the part of everyone in decorating a room to cover the walls, to fill empty spaces, forgetting that empty spaces are often a relief. Many authorities insist that pictures should be hung according to certain laws of construction —a strong base, a large centerpiece above, and a higher point above this, and then you get the triangle or you get the arch and do not violate the architectural laws. However, the observation of such architectural laws are not so important in the schoolroom as in the home. Pictures in a schoolroom are usually larger than those ordinarily used in the home and the hanging of them is limited to the space above blackboards. The frame of the picture should not rest on the frame of the blackboard, but a short distance above and the picture should be hung either with two wires, instead of one, or be hung miserably.

Fortunately there are available excellent handbooks and catalogs of pictures suitable for school decoration. Up to within quite recently the pictures found in schoolrooms have been almost altogether classical in subject and printed in black or brown. These have served their purpose, but there is a strong and well founded justification now to use pictures other than formal, classical and patriotic subjects, and the use of some of the remarkably beautiful and appropriate subjects, that have been so beautifully printed in color. Children love color, and a touch of color in a classroom naturally, devoid of much ornamentation, lends a note of cheerfulness and interest that could not be otherwise obtained. The Germans have long recognized this fact and there are now available in this country some admirable pictures in American lines that are also well suited. Nor are these color prints expensive. In fact, it will be found that a classroom can be decorated with color prints vastly cheaper than could previously be done in the more somber subjects that were available. Landscapes and out-of-door scenes, breathing a refreshing and wholesome spirit do wonders in creating a restful and cheerful atmosphere in the schoolroom.

The proper framing of all pictures is a question which should be considered. It is certainly not a subject which the amateur should neglect. Pictures should be taken to a dealer and frames tried on with the same care that one expends in the choosing of a hat or wardrobe. The nature and character of the picture must be

© Prang Co., N. Y. THE PLOWMAN. Georgi.

© Cosmos Picture Co., N. Y.

MARTHA WASHINGTON.

Gilbert Stuart.

GEORGE WASHINGTON.

considered. The use of mats in large pictures is less common than before. Ordinarily, it is safer to frame pictures without a mat. A mat of one color may destroy some subtle tone of the picture and another serve its legitimate purpose and enhance the tone of the picture. There are many colors in stains and dozens of different tones and textures to be chosen from. The question of fashions in framing ought not to arise. No picture by its setting should be made to stand out and claim recognition for itself.

With discretion and comparatively small expense almost any school building can be made interesting by the addition of a few well chosen plaster casts. There is now a large and interesting selection of plaster casts to choose from and each year finds more and more of the world's greatest sculptures available at moderate prices.

One misty, moisty morning,
When cloudy was the weather,
I chanced to meet an old man
Clothed all in leather;
He began to compliment,
And I began to grin,
"How do you do?" and "How do you do?"
And "How do you do again?"

© Prang Co., N. Y. Lucy Fitch Perkins.

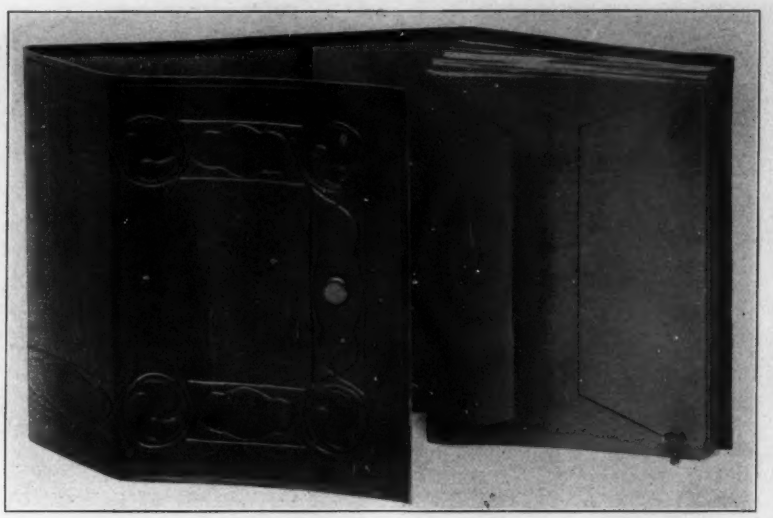
PERKINS'S MOTHER GOOSE PICTURE.

NOTRE-DAME DES ANGES. Bouguereau.

MADONNA DELLA SEDIA. Raphael.

The marvelous Winged Victory is one of the most popular for school use. The famous Singing Boys by Della Robbia in bas relief are favorites. So, too, are many of the wonderful Madonnas. The St. Cecilia is well known and is to be found among many groups of sculpture. It is particularly good in pure white, and deserves the dignity of a panel to itself. All of the large stores have catalogs of casts with names and prices. These catalogs are of great service. Casts should never be draped with silk. Silk or other material may be hung as a background and when this is done it proves often of great value. Any number of models might be named, but perhaps enough has been said to prove how easily a plaster cast lends itself to decorative purposes. A few illustrations are given to suggest tasteful arrangement and selection of pictures and casts which reflect good art sense.

© Prang Co., N. Y. RIPENING WHEAT FIELD. von Volkman.



1. Tooled Leather Envelope Portfolio.

# BOOKBINDING

Nancy Beyer

IN a commercial high-school course the student is taught pasting, mounting, repairing, making of portfolios, envelopes, notebooks, etc., which in themselves if never put to any practical use, are as everyday necessities useful things to know.

The making of envelopes is very simple. Children from the first grade up learn to make them, if for no other purpose than to write a letter.

A business concern finds the envelope most useful in which to file printed matter, photographs, cards or clippings, especially if the envelopes are made in the form of books. They can then be lettered and placed on a shelf for convenience.

Three of the illustrations are in book forms. The other a compact case for cards.

Illustration No. 1A is a design for an envelope. No. 1B is the plan for an envelope; the folding and pasting is to be done over a piece of cardboard the size of the finished envelope. The small holes in the closed flap, No. 1A, are used for lacing the envelopes together with a narrow strip of leather, tape or anything suitable to the outside cover.

One dozen envelopes are the usual amount used together, fastened to the cover by means of leather knots or buttons on the outside of the cover or by knots or buttons secured to the last envelope. The length of the tape or leather strip is equal to the width of the side pieces.

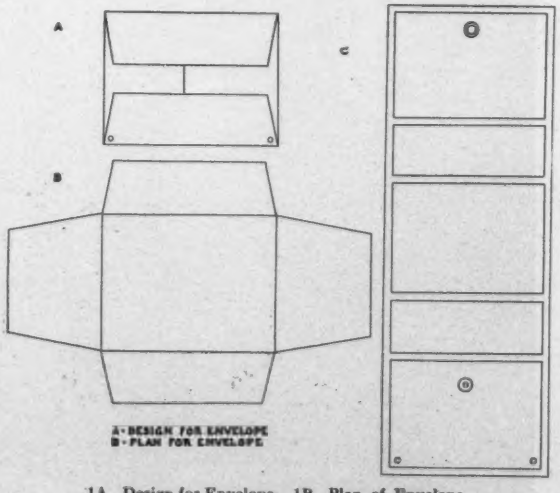
The inside cover of the case is lined with paper the same as the envelope. Pieces of manila board are cut to correspond with the plan in illustration No. 1C. The larger ones are the same size as the envelope. The smaller ones vary in width according to the amount of cards to be kept in the case.

The paper for covering is cut one-half inch larger all around, folded over and the half-inch pasted to the manila board. Corner turning the same as given in the article in the May issue.

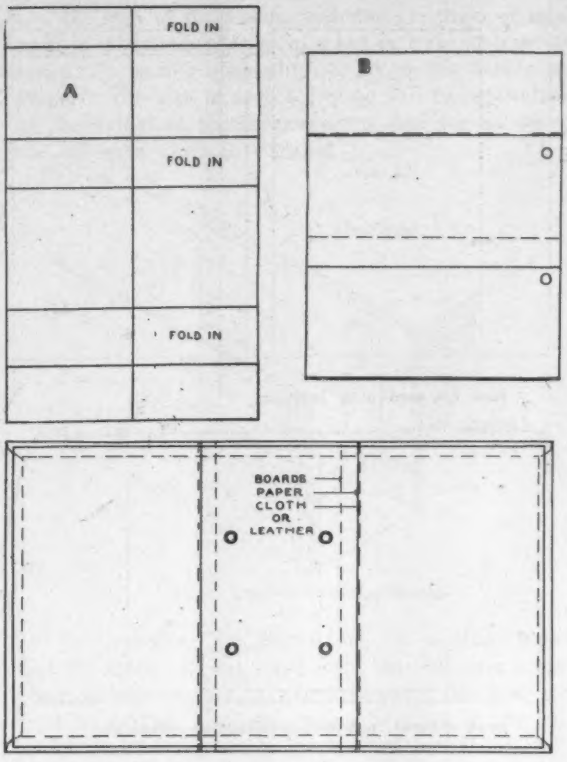
The five pieces of lining are pasted in place to the inside of the cover, pressed lightly for 24 hours, after which a clasp fastener is inserted as shown in illustration No. 1C.

Illustration No. 2 shows a book of pocket envelopes. Anti-mat paper is used for the leaves and for the outside cover which is wood block printed with a design in color to correspond with the leather or cloth which is used over the back part; in any case this should be flexible.

No. 2A is the plan for a pocket envelope. All of the horizontal lines are folded before folding the leaf in




1A. Design for Envelope. 1B. Plan of Envelope. 1C. Inside of Cover.




2A. Designs for Envelope (Original 15 by 24 inches).
2B. Appearance of Leaf after Folding (Original 7½ by 9¼ inches).

the center, which makes a leaf like the leaves in a Japanese book, a row of pockets on both pages.

No. 2B shows a leaf folded and holes made for lacing.

No. 2C is the inside of case cover finished with eyelets for lacing in leaves. Tape, leather or cord used for lacing.

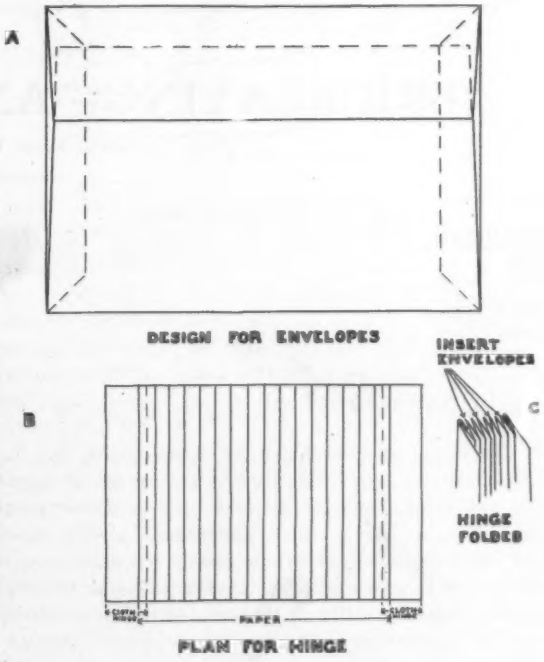
Illustration No. 3 is a plain envelope book used for mounted photographs. No. 3A is the design for the envelope. No. 3B is the plan for the hinge, made of paper same as the envelopes. No. 3C gives a perspective view of a hinge folded ready for inserting envelopes and cloth pieces attached at each end. The envelopes are

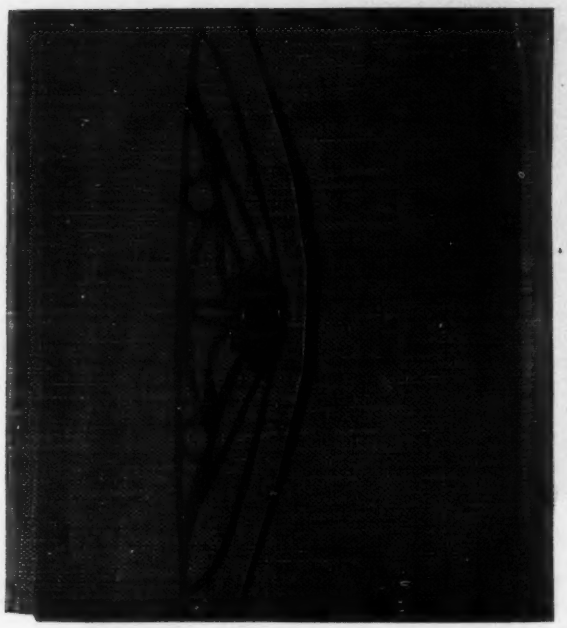
3. Plain Envelope Book.

2. Book of Pocket Envelopes.

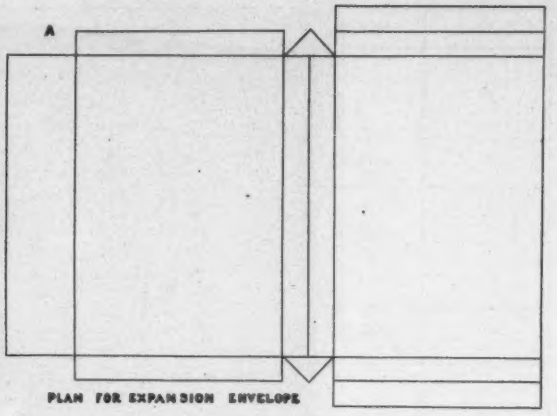
pasted between every other fold in the hinge. Boards are attached to the cloth hinges just the same as described in magazine binding in the May issue. The book is covered by the same method as given in magazine binding in the May issue. A whole cloth cover or part paper and part cloth cover is used.

Illustration No. 4 shows an expansion envelope book. This varies in size according to the printed matter to be filed in the envelopes. Envelopes of any size have half-inch folds in the envelopes, as may be seen in





4. Buckram Book of Expansion Envelopes.



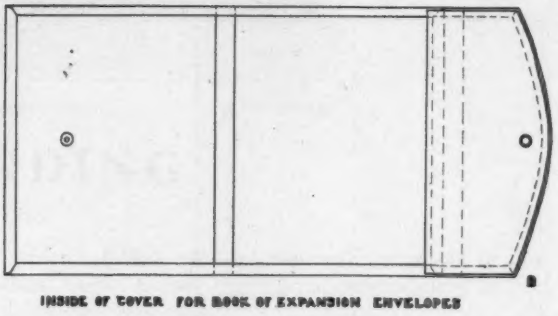




Fig. 4A, and half-inch folds in the paper hinge, as shown in illustration 3B. The only difference in pasting the envelopes to the hinge is in the fold of the envelope which slips over a fold of the hinge as shown in 3C, instead of between the folds. This will permit the envelope to expand at the edge as well as the middle. In place of stiff boards for a cover, as in illustration No. 3 flexible manila board is used. The cloth cover of Royal Buckram is not pasted to any part of the manila board excepting where it is turned a half-inch on the inside.

The flap in illustration 4B is made with a piece of Buckram, a piece of manila board and lined before pasting to the entire cover. The envelopes made according to plan in 4A and pasted to the paper hinge as already described, are pasted to the cover by the cloth hinges, illustration 3B. Back edges of envelopes and manila board are placed edge to edge. Paste the lining the same as in magazine binding. A clasp fastener is inserted in the flap. The flap may be decorated if preferred.

# "BRICKLAYING---AN INDUSTRIAL ART"

**Wm. T. Gohn, Stout Institute, Menomonie, Wis.**

**(Fourth Article)**

**Piers and Foundation Walls.**

KNOWLEDGE of foundations and their several methods of construction is necessary in brickwork.

The method of constructing foundations will vary with the nature and bearing capacity of the soil. In the order of their bearing capacity, soils are composed of rock, gravel, sand and clay.

The most secure subsoil for foundations is rock because of its incompressibility. All rock is not sound, but sometimes contains fissures and defective parts. These fissures must be filled, all unsound parts removed and the whole brought to one level by the addition of concrete. If a stratum of solid rock is found, the work may be started directly on it, provided it is near enough level to successfully hold the work.

Next to rock, gravel is the most incompressible soil, and is not easily affected by the changes and action of the atmosphere. It is on this account that gravel is considered an excellent substratum upon which to construct foundations; and especially in such localities as would be exempt from the occurrence of any lateral movement. Sand is also incompressible and a secure soil for foundation, provided no lateral movement is likely to occur, as might be caused by the action of running water washing the sand from beneath the foundation.

Clay is the most dangerous soil upon which to build, on account of its contraction and expansion, caused by atmospheric changes. If, however, proper precautions be taken, that is, if the foundations extend deep enough to be beyond the frost line, it is feasible to erect structures upon clay.

On each of these soils, with the exception of solid rock, it is customary to form a bed or layer of concrete to act as a footing upon which to lay up the foundation proper. The area of such a footing will be determined by the weight of the superstructure and the nature of the soil upon which it is placed.

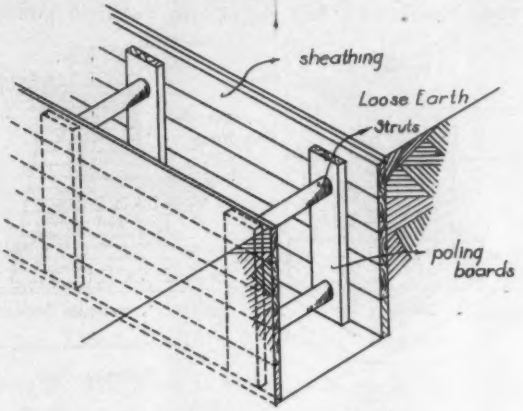



Fig. 1. Common Method of Shoring.

In excavating for foundations, it is often found that the earth will not stand firm, but will have a tendency to slide or cave in. In such cases, the loose soil must be curbed, until the trench be filled or the embankment held in place by the finished foundation wall. This method of curbing or retaining the embankment is known to the trade as "shoring," of which there are several methods employed. Figure 1 illustrates one of the most common methods of shoring. It consists of horizontal sheathing usually of 2" by 8" timbers held in place by properly spaced uprights known as *poling boards*. These *poling boards* are spaced about six (6) feet apart and are of the same material as the sheathing. The struts as shown, can be made of any material having a diameter of at least four (4) inches.

When preparing footings, on which a foundation wall is to be built, and especially one of brick, it is quite

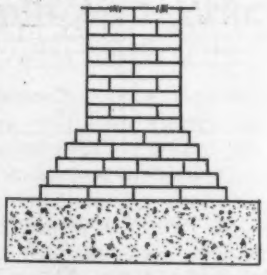


Fig. 2. Each Course Recedes ½ Height of Step.

important to keep the work in line and to have the top of the footings level.

Footings may be of large flat stones or a solid bed of concrete, the latter being preferable in that it serves as a homogeneous mass, and is cheaper and more easily put in place. Figure 2 illustrates the proper method of laying a footing and foundation wall of brick.

Concrete for the purpose of footings should be mixed to the following proportions—1: 2½: 5. Using such a mixture, one (1) cubic yard of concrete would require one and one-fourth (1¼) barrels of Portland cement, nine (9) cubic feet of sand and twenty-seven (27) cubic feet of broken stone or clean screened gravel. For such a mass of concrete it would require from three-fourths (¾) to one (1) barrel of water to make the proper mixture and bring it to the required consistency.

If footings be constructed more than twelve (12) inches thick, it is best to place the concrete in layers of not over six (6) inches depth, care being taken to make the proper bond between the two layers, since the joint caused by the time of setting between two or more days' work will always be a weak part of the wall. Before placing a second layer of concrete, the previous layer should be thoroly wet and a coat of neat cement be applied to act as a binder.

All foundation walls, whether of brick or stone, should be laid in cement mortar, and especially that part of the wall below the grade line. The building laws of most of the larger cities require this type of construction. The mortar for such purposes should be of the following proportions: One (1) part of Portland cement to three and one-half (3½) parts of screened

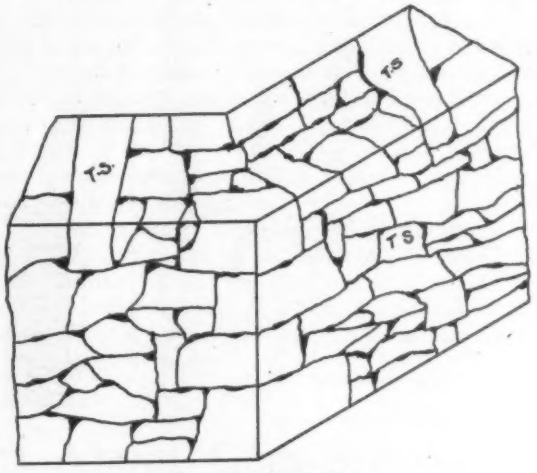



Fig. 3. Randum Rubble.

sand. The amount of materials and cost required to lay one thousand brick, having approximately ⅜ inch joints, of such a mortar, is as follows:

| | |
|---|---|
| 1¼ barrels (5 sacks) Portland cement @$2.00 per bbl | $2.50 |
| 18 cubic feet sand @$1.50 per load of 1 cubic yard | 1.00 |
| Total per M. brick | $3.50 |

Of course the prices for cement and sand will vary with the locality, the season of the year, and the distance of transportation. The prices here quoted are given as a basis for computation.

Figures 3, 4 and 5 illustrate several methods of constructing foundation walls, using stone as the chief building material. Figure 3 shows the method most common in ordinary house foundations, and is known as

"random rubble." For proper bonding, it is requisite that "thru stones," or as some authorities give it "bond stones," be inserted at intervals of four or five feet and about every eighteen or twenty inches in height.

Figure 4 shows a more regular method of stone

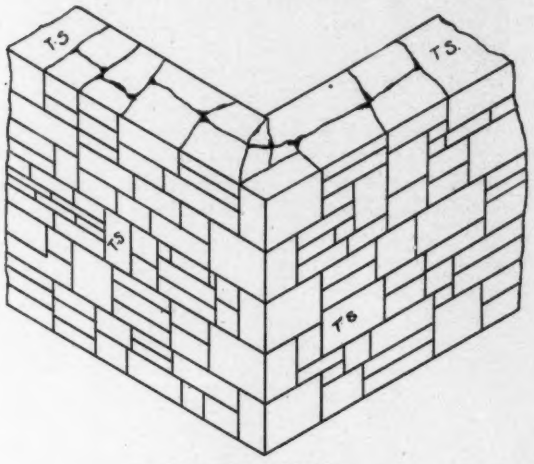



Fig. 4. Squared Rubble.

foundation, and one in which more care must be exercised in its construction. The same is true with such work as illustrated in Figure 5, where the wall is only veneered with stone and has a backing of brick work. In this type of construction the stone and brick work

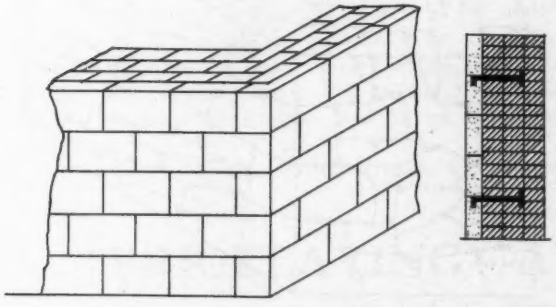


Fig. 5. Stone Veneer

are held together by means of anchor irons as shown in the sectional view. The latter method of stone foundation is only used on work showing above the grade line.

**Piers.**

Piers are usually designed and constructed to support beams and girders and consequently play an import part in the structure as a whole.

There are three types of piers, viz.—isolated, battered and connected. Figure 6 represents a 21" by 21" isolated brick pier containing one "ring" or "bond stone" and a "cap stone." Piers should be started upon concrete footings with a sectional area twice that of the pier proper, and should recede in regular steps or offsets one-half the heighth of each course. An isolated pier should never exceed in heighth ten (10) times its least dimension, and it should contain bond stones placed at regular intervals in the heighth. The purpose of these stones is to add strength and give greater coherency to the pier as a whole. Piers constructed for the purpose of supporting beams and girders should always be capped with a stone of great hardness, such as blue stone or

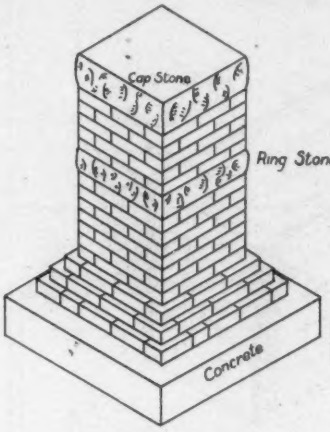



Fig. 6. Piers.

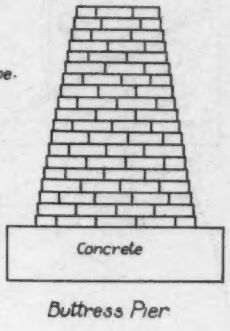



Fig. 7.

granite. This is done for the purpose of receiving the cast iron bearing plate, and to distribute the weight of the concentrated load more evenly over the entire pier.

Piers should be laid up of good hard-burned brick, in Portland cement mortar, having full joints and the work well grouted with cement about every fourth course. All ring and cap stones should be carefully bedded in cement mortar and be laid level and flush with the four faces of the pier. These stones should always be of full

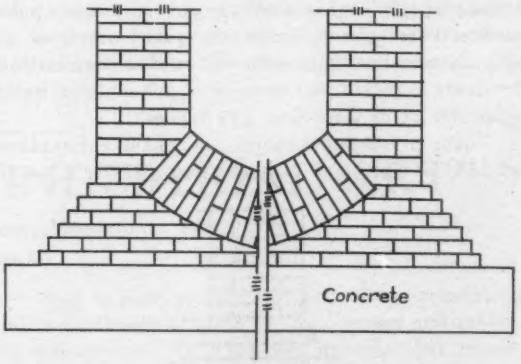



Fig. 8. Connected Piers.

size and should be inserted about thirty (30) inches apart.

The battered or tapered pier, Figure 7, is the strongest type that it is possible to construct. On account of the extra labor and great amount of space they occupy, this type of pier is seldom used, excepting for bases or foundations for machinery or in localities where the soil is exceedingly compressible.

Connected piers are those bonded to walls or those connected by an inverted arch at their bases. Figure 8 shows connected piers of the latter type. This type of connected piers is used where the subsoil is rather

marshy, in order that the weight carried by several piers is transferred over a larger area.

**Damp Courses.**

It is frequently essential when constructing for foundation walls to prevent moisture from rising in the walls. With the exception of granite, practically all building materials are porous and transmit or absorb

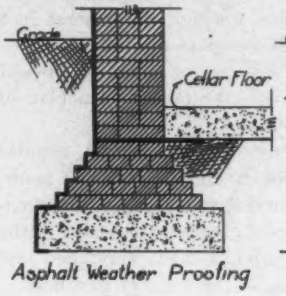


Fig. 9.

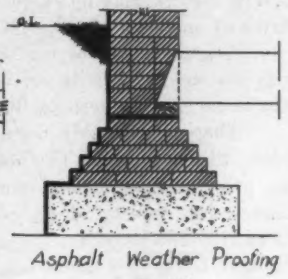


Fig. 10.

moisture. Dampness in buildings is due to the following causes:

(a) Absorbing moisture from the soil.

(b) Improper bonding and poor joints.

(c) Moisture being driven into the wall during heavy storms.

(d) Wetting of brick before laying them.

A damp-proof course should serve a twofold purpose. It should not only prevent the moisture from being absorbed into the wall, but should not hinder its expulsion. The methods used to prevent the absorption of moisture is an application of some waterproof material on the exterior surfaces of the walls or the insertion of a horizontal course of hollow tile a few feet above the footing acting as a non-conductor of moisture. To allow the expulsion of moisture, the walls must be properly ventilated on all sides, and a layer of drain-tile should be inserted at the foot of the wall, especially if the wall contains a hollow compartment.

There are numerous devices for preventing moisture from entering and arising in walls. They are usually

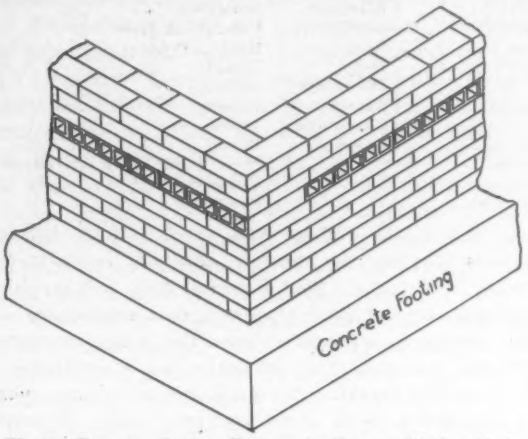


Fig. 11. Damp proofing by a Constructive Feature of Hollow Blocks.

divided into two distinct classes (a) exterior applications, (b) constructive features.

Great care and thoroness must be exercised if the result of the former is to be efficient. Figures 9 and 10 illustrate two methods under (a) while Figure 11 illustrates a damp-proof course as a constructive feature.

The materials used in weather-proof walls, as shown in Figures 9 and 10, are rock, asphalt and Portland cement, while those illustrated in Figure 11, are hollow terra cotta blocks or brick.

Asphalt is by far the better and more universally used material for exterior applications. It should be applied boiling hot and the coat applied should in no place be less than one-half (½) inch in thickness. This coating should be applied preferably in two or more coats to insure the best results.

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# Simple and Practical Facts About Gem Stones

S. J. Vaughn

WHEN we buy gems nowadays, we buy luxuries; and when we buy luxuries we most plainly reveal our tastes. The slogan of the art students in the Latin Quarter, that "We can do without the necessities but we must have the luxuries," seems to have an element of truth.

The love for precious stones seems to be as old as the race. The beauty, characteristics, and reputed mystic power of gems have been woven into the history, legend and story of every people of the earth.

Thruout the ancient and mediaeval times, marvelous stories of the curative powers of stones were accepted with implicit faith. Happy the sufferer from liver complaint, if he could only get possession of a ruby. Unfortunate, indeed, was Job that he could not have a sapphire, for sapphires cure boils. The Apostle Paul need never have been shipwrecked—in fact *could* never have been—if he had only carried in his pocket a piece of coral, for among other properties, the precious coral has the power of preventing shipwrecks. The wise Aristotle himself advised the wearing about the neck of certain stones to prevent the attack of certain dread diseases. Practically every stone came to be regarded as a specific for disease, business, or matrimony, so numerous were the superstitions, some of which persist even to this day.

Some very interesting legends and customs have arisen out of these beliefs. Perhaps the most interesting is the assignment of a particular stone with its special significance to the month of one's birth. A list of the birthstones and their sentiments follows, not as a matter of information, but as a matter of interest in this connection.

| *Month* | *Stone* | *Denotes* |
|---|---|---|
| January | Garnet | Constancy |
| February | Amethyst | Temperance |
| March | Bloodstone | Wisdom |
| | Hyacinth | Courage |
| | Sapphire | Repentance |
| April | Diamond | Innocence |
| May | Emerald | Fidelity in Love |
| June | Agate | Health, Peace |
| July | Ruby | Vitality |
| August | Moonstone | Felicity |
| | Sardonyx | Fidelity |
| | Chrysolite | Joyousness |
| September | Sapphire | Purity, Truth |
| October | Opal | Hope, Keen Sight and Faith |
| November | Topaz | Friendship |
| December | Turquoise | Prosperity, Love |

Gems of the highest rank excel in four distinct qualities or properties, namely, hardness, color, transparency, and luster. The diamond, ruby and sapphire possess all four of these properties to a marked degree, while among the commoner stones, the garnet, amethyst, and topaz possess all four properties in a lesser degree.

Generally speaking, for a mineral to rank as a gem, it must excel in three of the four properties. However, some very popular and beautiful stones have only two of these properties. The turquoise is both soft and opaque, but it has distinctions of color and luster which give it a rare beauty.

The wearing quality and hence the permanency of a gem's beauty depend very largely upon its hardness. Therefore the quality of resistance to scratching is an important one. The hardness of gems has been expressed by the Mohs Scale, which takes ten common minerals from the softest to the hardest, ranking in hardness from one to ten. The following is the scale:

1. Talc.
2. Gypsum.
3. Calcite.
4. Fluorite.
5. Apatite.
6. Feldspar.
7. Quartz.
8. Topaz.
9. Corundum.
   Ruby.
   Sapphire.
10. Diamond.

The common method of identifying gems by their colors is entirely unreliable. We have become accustomed to associating certain colors with certain stones. Some people class all red stones as rubies or garnets, unmindful of the fact that garnets are also green, rose, black, brown, and yellow; that the ruby is the same mineral as the sapphire, and that diamonds, opals, carnelians, tourmalines, and others are often red.

It is a great help to one to be able to make certain group distinctions. The largest group of gems is the Quartz group. Many persons speak of quartz as if it were a single distinct stone with unvarying characteristics. Yet, among the great varieties of gems which properly belong to the quartz group but have distinct names by virtue of certain peculiarities of color, luster, and texture, may be mentioned the following popular gems:

Rock crystal, amethyst, rose quartz, cat's-eye, chalcedony, carnelian, bloodstone, agate, and onyx.

Rock crystal, or "frozen ice," as the Greeks called it and thought it to be, is the uncolored and highly crystalized form of quartz. Amethyst, rose quartz, and cat's-eye possess the characteristics of color indicated by the names. Carnelian is a red variety of chalcedony, and the bloodstone is a green variety containing specks of red jasper.

When quartz shows a distinct banded or clouded structure of various colors, it is called agate. When the bands are straight, regular, and uniform in thickness, it is called onyx. When some of the layers of the onyx are brown, it is called sardonyx, because the brown is the variety of chalcedony known as sard. The onyx is extensively used in making cameos, the figure being cut in a layer of one color, resting on a base of another color.

A great many of the varieties of agate in present day use are artificially colored, the porous structure of the stone easily absorbing fluids.

There is probably no more beautiful and popular stone than the opal. The beauty and value of the noble, or precious opal depend almost wholly upon the brilliancy and variety of its ever-changing colors. Altho beautiful and popular, the opal is easily scratched and broken, being only about 5½ in the scale of hardness.

There still lingers a peculiar superstition that opal is an "unlucky" stone. Suspicion may have arisen from the fact that the opal often loses entirely its iridescence, or "fire," and sometimes as mysteriously recovers its lost brilliancy. However, from ancient times, the opal has been the symbol of hope—not of bad luck, and it is almost the only stone that has not been successfully imitated.

Some of the most attractive settings are made of the matrix of opal, which is the dissemination of the opal thru the rock in which it is found.

The familiar turquoise is another soft but extensively used stone. It ranges in color thru blue, green, and gray, altho sky blue is the standard Persian stone. In time, practically all turquoises will turn green under constant exposure to strong light, heat, or acid fumes. Like the opal, the turquoise appears in a beautiful matrix, but unlike the opal, it is very easy of imitation.

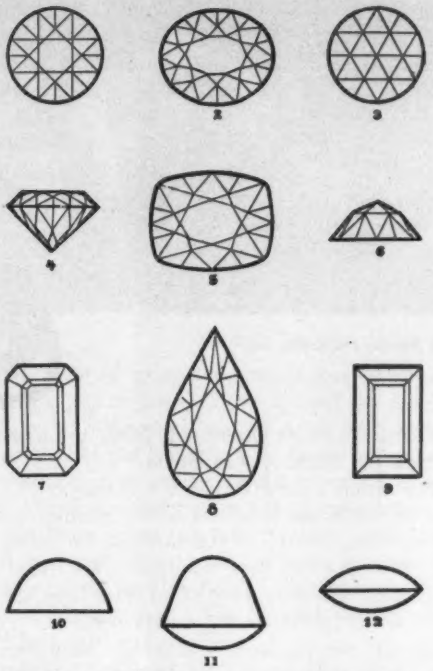
The moonstone makes a beautiful setting, especially in silver. The quality of a moonstone depends upon the bluish opalescence reflected from the polished stone. A great many milky stones pass as moonstones under the name of "California Moonstone." These are translucent chalcedony pebbles which are picked up from one of the beaches of California, and of course are not moonstones at all.

The Labradorite is closely related to the moonstone, both belonging to the feldspar family. The Labradorite has the characteristic cleavage of feldspar and shows a beautiful play of green and blue when held at certain angles to the light.

Jade, a highly prized gem of about the hardness of quartz, occurs in various shades of green. The Chinese jade is a very light green clouded with white. The New Zealand variety is a dark green and is only about one-half as expensive as the Chinese jade. Either variety makes a very attractive setting in both gold and silver.

Besides the stones already mentioned, the following stones are both popular and satisfactory for jewelry work, altho quite soft: Malachite, hardness 3.5; lapis lazuli, 5.5; azurite, 4; coral, 4; Amazonite, 6.

The cutting of stone is an important consideration.



Typical Cuttings of Gem Stones. Courtesy Espositer-Varni Co., Lapidists.

Altho few stones would make pleasing settings without the aid of the lapidist, yet cutting and polishing alone cannot bring a dead, lusterless, opaque stone out of its ugliness. The aim of the stone cutter is to take advantage of the characteristics of the particular stone and to treat it in such a way as to emphasize its natural beauty. There are two main classes of cuttings. 1. Curved. 2. Facetted.

The following are the typical cuttings:

1. Round Brilliant (top)
2. Oval Brilliant.
3. Rose Cut (top)
4. Round Brilliant (side)
5. Cushion Brilliant.
6. Rose Cut (side)
7. Step Cut (octagon)
8. Pear Brilliant.
9. Step Cut (rectangular)
10. Cabochon (low)
11. Cabochon (high)
12. Lentil (side)

The accompanying illustrations are used thru the courtesy and with the permission of Espositer, Varni Co., the reliable and well known New York Lapidists.

A short time ago, an intelligent lady was inspecting a large selection of such gems as mentioned above and asking the prices of the various stones. On being told that the prices ranged from 50c to $5.00 each, she remarked, "Of course, they're not genuine." She was greatly surprised when she was assured that the genuineness of every stone was absolutely guaranteed by a reliable lapidary.

This estimable lady, like a good many others, had been deliberately buying imitation amethysts, topazes, agates, turquoises, etc., on the ground of economy, when it turned out that she could have bought a fair grade of genuine stones for what she had paid for the imitations.

An announcement from a prominent and enterprising firm advertises for sale "Genuine Enamel Stones!" which, being interpreted, means "Genuine Fakes." There are firms in every large city which make glass imitations by the bushel, and what is more disconcerting still, they find a ready market for their trash. Thousands and thousands of dollars worth of these imitations are sold to dealers in Mexico who promptly sell them to tourists who go home proudly carrying some "real Mexican gems direct from the mines," and leaving a hundred times their value in real American money.

Glass can be colored, cut and polished in exact imitation of most stones. The very simplest sort of tests would detect a great many of these forgeries. For instance, stones of the quartz group rank about 7 in the scale of hardness, while glass falls below 6. Hence, the amethyst, the rose quartz, the bloodstone, the agate, etc., will easily scratch glass. If in testing any one of the above stones, it scratches glass, it is certain that the gem itself is *not* glass. If one of the above group fails to scratch glass, it is an imitation. Of course in the test, an edge or a corner of the stone must come in contact with the glass.

A file will easily cut glass, whereas it will scarcely make any impression at all on quartz, and stones harder than 7, such as topaz and emerald, are not affected at all by a file. An aluminum pencil will not mark the hard stones but will leave a distinct mark on glass. On the softer stones, it makes correspondingly larger and more distinct marks. Thus the test of hardness, by either of these methods, will disclose whether or not glass is masquerading under the names of amethyst, topaz, garnet, agate, jade, moonstone, or any of the stones ranking 6 or above. If such a specimen is not glass, the strong presumption is that it is genuine.

However, there are other deceptions besides making glass imitations of gems. One genuine stone of a certain color may be represented to be an entirely different and more expensive stone of the same color. Thus the garnet has been frequently substituted for the ruby, the finest grade of which is the most valuable gem known. White topaz has been sold as diamond.

Reconstructed gems are now in abundance on the market. In the cutting of such stones as rubies, sapphires, emeralds, etc., an accumulation of dust and chips results. These are heated until they fuse into a solid mass. This mass is cut into gems and called "reconstructed stones," at a much smaller price than the original natural stone. This is not a vicious practice, unless the purchaser is made to believe that he is buying a genuine gem very cheaply, which he is often made to believe.

The doublet is another product where the most has been made of the small pieces of the genuine stone. In this, a very thin piece of gem is pasted on the top of a piece of glass, enamel, or other substance colored to

match the genuine part. Ruby, emerald, and sapphire doublets are being sold in great quantities. Usually the line where the genuine and the false parts come together may be seen on close examination.

Opal doublets may be bought which have a very thin layer of high grade opal on a composition base of an entirely different color. In this, an effort is made to use a thin piece of fine opal to the best advantage frankly, without pretense or deception.

It is well to become familiar with the various standard stones, their properties and their tests. But after all, much of the matter concerning gems will be left to the jeweler or the lapidary, and it is very important to deal with one or the other upon whom entire reliance can be placed.

# HAND-WROUGHT JEWELRY

**H. R. Sorensen, Proprietor Orno Shop, DeKalb, Ill.**

**(Sixth Article)**

**The Setting of Odd Shaped Stones.**
**The Abalone Blister.**

ABALONE BLISTERS are cut from the inside of Abalone shells having an iridescent and irregular surface. These shells are found in the waters of the Pacific Ocean on the coast of California.

The blisters when considered good, usually possess beautiful colors. They are, as a rule, very thin at the top and require a filling of plaster of paris or jewelers' cement.

The difficulty experienced in setting these blisters lies in the fact that the edge is very irregular and the bottom is not even. The irregularity of the bottom can almost always be remedied either by filing off as much material as possible without injuring the shell or filling the low places with jewelers' cement, thereby giving it an even surface as shown at A, Fig. 18.

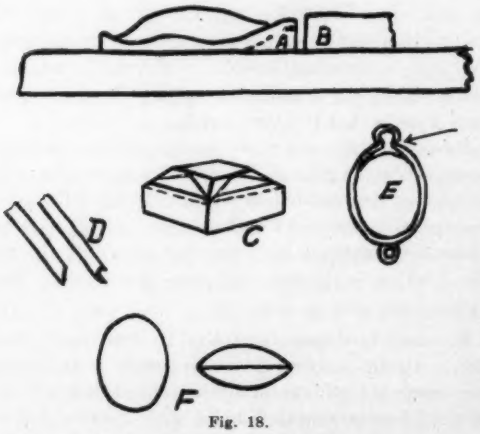



Fig. 18.

It is very important that the bottom should be flat as it is very difficult to make the setting when it is not so.

The bezel material should be gauge 28. It should also be cut a little wider than the highest point of the edge of the blister when lying on a flat surface, Fig. 18. The silver can then be fitted to the blister just as one would fit it to any other stone. After the silver has been fitted, the connection made and soldered and the final fitting has taken place, it is ready for soldering to the article for which it is intended.

The article should be cleaned thoroly. The blister is then placed in the bezel and with a pointed tool a line is traced along the top of the shell on the inside of the bezel. The shell is then removed. The bezel should then be filed to within 1-32 of an inch from the traced line. Files of different shapes are necessary when removing the surplus bezel material. Engravers' tools are of great assistance also.

When an even edge of silver projects above the edge of the abalone the edge is filed on the outside, near the top, making it thinner and easier to turn over the edge of the shell.

The burnishing tool described before should be used in turning the bezel over the shell.

**Baroque Pearl.**

The Baroque Pearl is usually white and is commonly called a slug. It is set in many different ways. One way is on a rivet. This is done by drilling a hole into the pearl and inserting a piece of wire the size of the hole. The wire is first soldered to the article in which the pearl is to be set. The pearl is fastened to the rivet with pearl cement. This method is not very secure as something might easily catch under the pearl and release it from its setting.

Fig. 19. Setting Baroque Pearl.

Fig. 20.

This style of using the rivet is good when one intends using leaf or flower forms around the pearl. The leaves can be soldered to the article in such a way that some portion of the leaves can be forced over the pearl. This setting is very attractive and is used a great deal.

The bezel is often used in setting pearl slugs. When using the bezel, when the pearl is quite high, it should be filed on the under side. If the pearl is to go on a flat surface it should be filed flat; if on a curved surface, it should be filed concave. The filing is also for the purpose of having it rest solidly.

In making a bezel for a pearl it is almost impossible to make it fit the outline of the pearl and really it is not necessary as will be shown when the actual setting takes place.

When the bezel has been completed and the soldering to the article has taken place it is cleaned thoroly. The pearl is then placed in the bezel and an estimate made as to the amount of the bezel to be removed.

Some parts of the bezel will be quite a little lower than other parts. The bezel must be high enough all around the pearl to fit over it and assist in holding it securely.

When setting a pearl, in a ring for instance, the ring is put on the ring mandril, resting on the lead cake and the setting is done by a tool which resembles the pushing tool which is used for other settings.

This tool has no handle and the end is only one-third as large as the end of the pushing tool. It becomes necessary to use a hammer with this tool, Fig. 19. With this tool and hammer we can easily force the metal very close to the pearl. This tool is liable to leave ugly marks if not used carefully. When using it use it in such a way as to give the edge of the bezel a finished appearance. This can be done by tapping the tool lightly.

**Setting a Square Faceted Stone.**

A stone of this kind usually needs a wide bezel as it is almost always very deep. Another thing to keep in mind is that a square stone is seldom very accurate; one side is almost always a little different from the others.

In making the bezel the seam is put on one side, not in a corner, as it is liable to fill up with solder. It

Using the Draw Plate.

is also necessary to make this bezel double as the stone must have a base on which to rest.

One will most likely discover a difficulty in getting the metal close to the stone at the corners, but this can be remedied by filing a V-shaped notch at each corner. Then when the sides are forced over the stone the corners should meet perfectly, C, Fig. 18.

**Setting of a Stone Having the Lentil Shape.**

These stones, F, Fig. 18, are used in chains or other pieces of jewelry where there is a possibility of its turning over and exposing both sides. The band which holds the stone is made of bezel material and is half-round hollow wire.

To make this, one can take a piece of bezel material a little less than ⅛" wide and as long as desired and shape it half round with the riveting end of the hammer, Fig. 20. This should be done on the lead cake. When the material has started to shape half round, it is drawn thru the drawplate until the desired curve has been obtained, D, Fig. 18. When drawing the material thru the drawplate a piece of pointed hard wood should be held in such a way so that it fits between the curve of the drawplate hole and the inside of the bezel material. This piece of wood helps to make the wire smooth. The wire should be annealed several times during this operation.

It is quite difficult to shape the wire to the stone, so a piece of solid wire is shaped as near like the outside edge of the stone as possible. Then the bezel wire is shaped around the solid wire the seam being at one end if an oval shape is used. The bezel wire should fit around the stone so the ends meet perfectly.

The band of hollow half wire is now ready for the rings on which the chain is connected. The open end of the band should be separated as shown in E, Fig. 18. The little ring should also be separated and soldered to the band at points indicated by the arrow.

Then, when the stone is slipped in the setting the band is forced together using pointed nose pliers and the stone is set.

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**Always be able to do a thing as well as you can explain it.**
**Always be able to explain a thing as well as you can do it.**

Moline, Ill. John A. Williams.

# PROBLEMS IN DESIGN

Bonnie E. Snow, Millburn, N. J.

(Lesson V)

### 1. The Application of Design Principles.

ART is more than representation. Our growing appreciation of this fact is influencing to a marked extent the up-to-date courses of art study in our schools. A person may be ever so skillful in drawing or painting, he may understand the laws of perspective, and he may be able to express himself freely by means of drawing and sketching; but such training does not necessarily fit him to understand or to enjoy the beautiful results of the industries and crafts.

The Metropolitan Art Museum in New York was originally built to house a collection of paintings and sculpture; but the "museum idea" has expanded to such an extent that addition after addition has been built, in order to display collections of furniture, rugs, tapestries, porcelains, embroideries, laces, textiles, metalry, glassware and other useful things, made beautiful by the application of that particular phase of art that we call design. The great collection left by the late Pierpont Morgan is very largely made up of examples of the crafts and industries of former times.

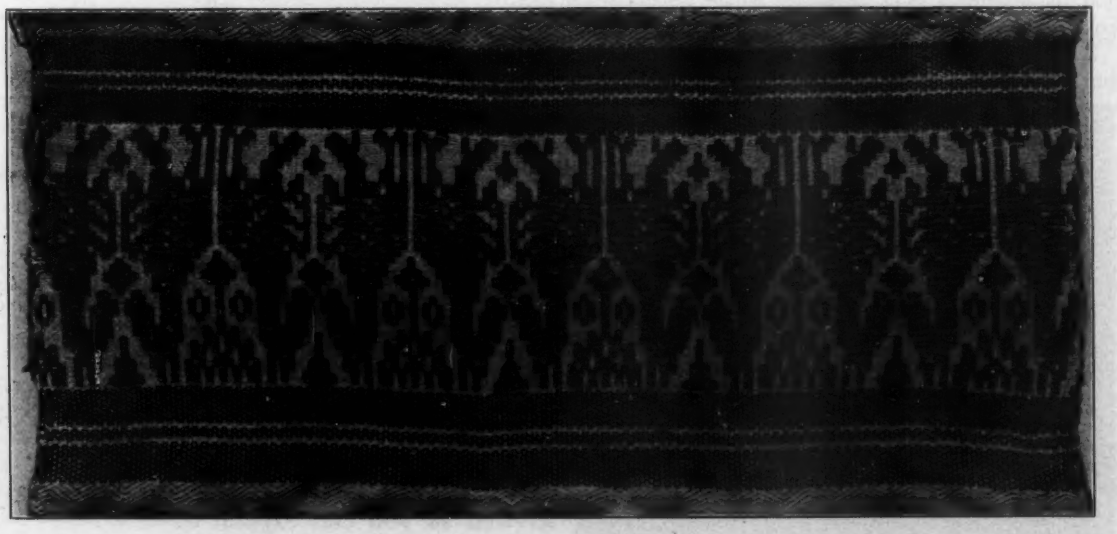
Surely, it is a part of the mission of art teachers to acquaint the public, thru the children, with the contents of our museums, and to show that the art element in these crafts and industries has been the means of their preservation. Such problems as have been given in this series of lessons in design—problems in the arrangement and grouping of lines and units—are an excellent means of stimulating the imagination and of cultivating judgment, taste and creative power. It is this sort of training that America needs, even more than training along the lines of drawing and painting.

"Mourning with Ruskin," says Gerald Stanley Lee, "is not so much to the point as going to work with William Morris. The fact that the mechanical arts are so prominent in their relation to the fine arts may not seem to argue a high ideal among us; but as the mechanical arts are the body of beauty, and the fine arts are the soul of it, it is a necessary part of the ideal to keep body and soul together until we can do better. If we have deeper feelings about wall papers, for instance, than we have about other things, it is going to the root of the matter to begin with wall papers—to make machinery say something as beautiful as possible, inasmuch as it is bound to have, for a long time, at least, about all the say there is!"

It seems sensible to admit at once that we in America are an industrial nation. It would seem sane and sensible, therefore, to approach art application thru the industries. This can best be done by changing the character of our school courses. The practical need of such a change so far as art courses are concerned becomes evident when we consider that all questions of dress, house-furnishings, building and decoration of all kinds are merely questions as to the arrangement of lines, areas and color shapes. Let us apply our theories of art to every day living. Such an application will help our understanding of the theories and will make daily living more interesting and more beautiful.

### 2. The Modification of Background Shapes.

In the foregoing problems we have seen that a certain amount of interest and variety may be obtained by a rhythmic repetition in which shapes and spaces are carefully proportioned and adjusted. Sometimes the nature of the repeated unit is such that the background spaces need breaking, in order to create new systems of rhythms and to secure greater interest. The fine piece



A beautiful bit of Weaving from the Looms of the Canterbury Weavers, at Canterbury, England.

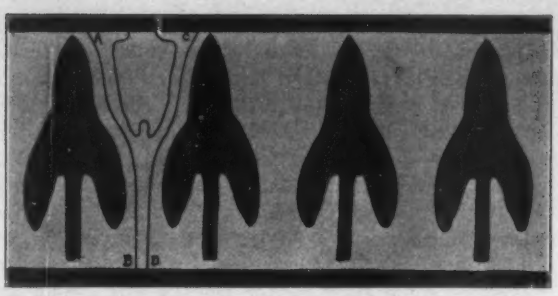


Fig. 2. A Rhythm of Leaf Shapes Suggesting Further Treatment of Back-ground Spaces.

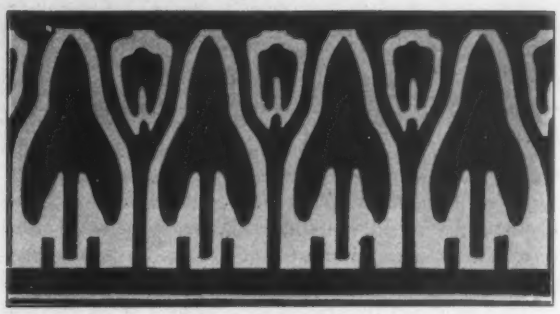


Fig. 3. The Border Enriched by Treatment of Back-ground Spaces.

of weaving from the looms of the Canterbury Weavers, in Canterbury, England, (Fig. 1) provides an interesting example of this manipulation of background spaces. Here, the original repeat was evidently the "horse" shape. The repetition of this shape apparently left spaces that needed further treatment. A new system of shapes was therefore introduced, adding greatly to variety, and establishing a perfect balance between the original repeat and the background. All parts of this beautiful border are inter-related. In addition. the design has been so successfully adapted to the process of weaving that a delightful reversal of values is seen on the other side of the fabric. The shapes that appear light on one side are dark on the other. The colors used were a splendid blue for the decoration and a gray-white for the body of the fabric. It has the fine color quality of Chinese porcelain. The Canterbury Weavers proudly explained that this choice bit of weaving was a copy of an old Siena towel, preserved in one of the national museums. What a splendid message it brings us of the artistic industries of the past!

Let us try to work out this idea in a simple problem. In Fig. 2 a leaf shape is repeated and certain background shapes are established. We at once feel the need of further enrichment. This may be provided in several ways. We may draw a system of lines that conform to the general outline of the units, as shown in the lines A, B and C, D in Fig. 2. The wide space near the top is further varied by similar treatment, and a new shape results. This treatment is continued until a border of well-related shapes is produced, as in Fig. 3. The richness of effect attained by this addition of new rhythmic shapes is at once apparent.

There are several ways of securing a balance of light and dark, in an arrangement of lines, such as was first obtained by tracing the shapes of this border. Several tracings should be made of the same design. Then several different arrangements of light and dark should be made within these tracings. For instance, in Fig. 3 the background shapes might have been painted black and the leaf shapes left light. The benefit of making several arrangements of values (light and dark) lies in the fact that a constant exercise of the mind is demanded in the making of a choice between two or more arrangements. It is this frequent making of a choice that develops judgment—the ability to make the right choice when two or more propositions confront us.

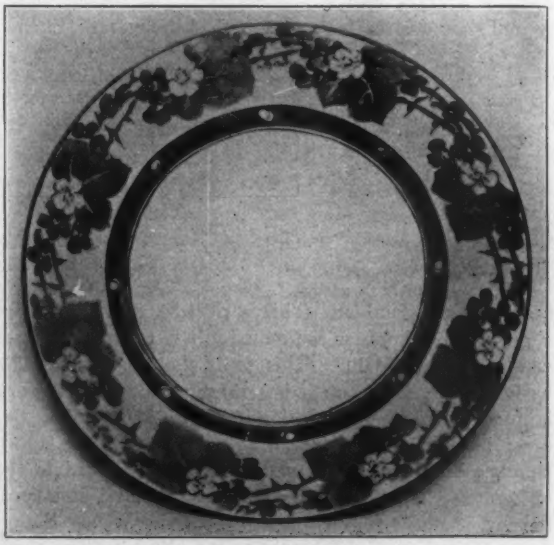


Fig. 4. A Low Standard of Design; Pictorial effects should not be used as Decorations.

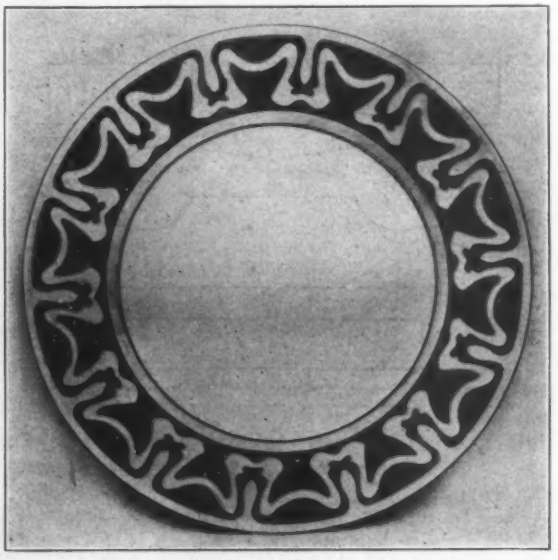


Fig. 5. A Good Design, because all parts are Inter-related.

Such exercises as are represented in Figs. 2 and 3 may be worked out in colored crayons or with water color. Toned papers may be used as a part of the color scheme, but in using colors the importance of a difference in values must not be overlooked.

### 3. Two Plate Designs.

For purposes of comparison, two plates have been photographed in Figs. 4 and 5. Figure 4 shows a border in realistic treatment. Such a decoration would be considered satisfactory, no doubt, by one who had not seriously considered this question of design in its relation to things of daily use. But viewed in the light of space relationships, the faults of the realistic decoration are at once apparent. There is not, in Fig. 4, a fine relationship between background spaces and repeated units. While a certain rhythm is established, it is not a rhythm that knits together all parts of the border. It tends toward pictorial rather than decorative treatment. Such ornament is better, possibly, than no ornament at all, but it indicates a low standard of art appreciation. We must lead the people away from this sort of decoration, by showing them that art is something more than even truthful or accurate representation. In Fig. 5, we see a design that seems to be a part of the plate itself. So intimately are motif and background space knit together that either might stand for the repeated unit. Such an understanding of the principles of design opens our eyes to new fields of interest and we learn to judge art manifestations about us from a higher standpoint and with a keener sense of the possibilities of art, when applied to daily living.

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# PRACTICAL SCHOOL SHOP FORGING

**Thomas Googerty, Pontiac, Ill.**

**(Sixth Article)**

### Exercise No. 16.

In forging tongs, stock 7/8-inch square of Norway or Swedish iron may be used, as it is much easier for a beginner in welding the handle on to the jaws. Soft steel may be used later on if desired. Figure 100 shows the drawing of a finished pair of flat tongs. Figure 101

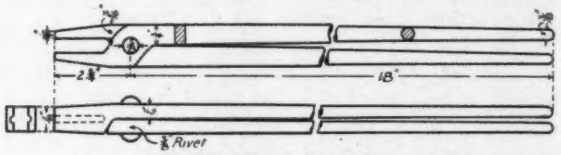


Fig. 100. Blacksmith's Tongs.

shows the size of stock used and the dimensions of the rough forgings. It is not intended that the dimensions given are to be accurately followed, but they are given as an idea of what may be forged from this size of

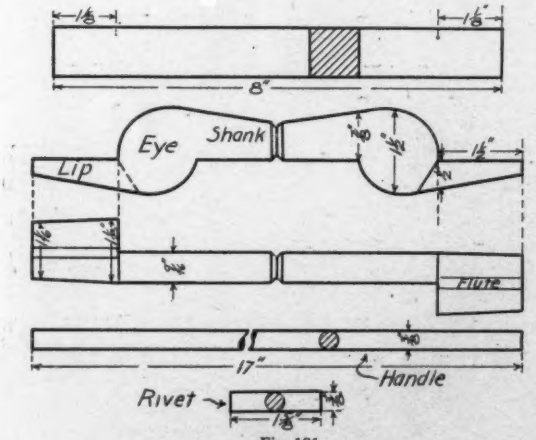


Fig. 101.

stock. In forging the jaws, no helper is required to handle a sledge hammer after the piece is cut from the bar; for the reason that it is time lost for the one who handles it, besides one can do it better than two.

In forging the jaws a heavy hand hammer is used and the bar heated to the welding heat, or near it. One- and one-eighth inch of the bar is set on the inner edge of the anvil and the lip is hammered as shown in Figure 102. The lip must not be turned and hammered on its edge. Let it get as wide as it will, and do not hammer

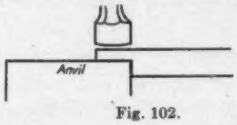


Fig. 102.

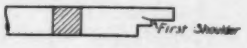


Fig. 103.

it too thin. After the shoulder has been started for the length of the lip, it must not be moved. A common fault is to start the shoulder and then to find the lip is not long enough and proceed to make another shoulder. The result of the second shoulder is that when nearly finished a crack will be discovered. The reason that a second shoulder starts a crack is that the metal stretched

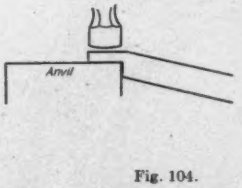


Fig. 104.

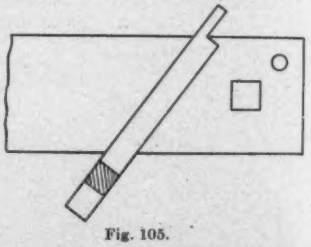

Fig. 105.

over the first shoulder. This is called a cold shut. See Figure 103. Another common fault is to lower the bar when making the lip. This pulls the lip on an angle with the bar and when it is straightened, another crack is formed in the corner. See Figure 104. The bar must be on the same plane with the anvil face at all times. When the lip is made, the bar is turned to the left, setting it on the outer edge of the anvil and hammering to form the shoulder for the eye. See Figure 105. It is then turned again to the left hand and hammered down for the last shoulder.

At this time the stock required for the eye is beyond the outer edge of the anvil. See Figure 106.

The rough forging should always be made a little larger than the finished tongs; finishing it to size when

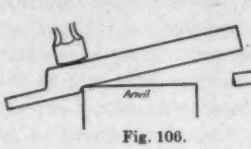


Fig. 106.

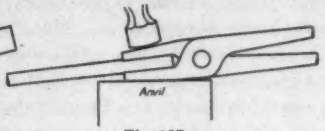


Fig. 107.

the handle is welded on. When both jaws are forged, they are cut in the center and the handles are welded on. When the handles are well upset and scarfed, the shanks of the jaws are drawn to equal size. Care must be taken in having the scarfed ends equal in size or a poor weld will result. The handles at the weld are drawn square with the corners tapered off. The jaws are now drawn and fitted to size. Notice that the lip tapers on the edge; also on the flat part. A small flute is filed lengthways on the inside of the lip so that round as well as flat iron may be held. The hole is next punched thru the eye with a hand punch. A piece of ⅜-rod of soft steel is cut to the proper length and used for a rivet.

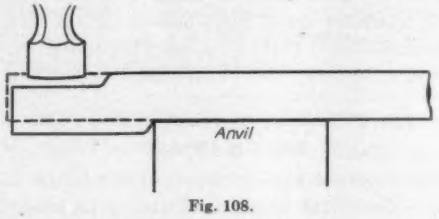


Fig. 108.

It is heated and inserted into holes in the jaws and hammered on both sides with hard blows. The jaws of the tongs are now heated red and worked back and forth to loosen the rivet in the eye. The jaws are fitted to the size of the stock they are to handle as in Figure 107. The regular stock rivets should not be used in tongs. The ⅜-inch round piece headed from both sides fits the holes thru the eye best.

In making tongs to hold a larger piece of stock, the square bar should have an offset. The jaws should then be forged as in Figure 108. Notice where the hammer strikes the bar to offset it.

In forging tongs, the handles should be welded to the jaws to give practice in welding.

Crucible steel, or tool steel called cast steel, is made by using high grade, Swedish, low phosphorus, wrought iron and adding carbon. The oldest method is called "Cementation process." The iron bars are packed in air tight retorts with powdered charcoal between them. They are put in a cementation furnace, heated red hot and kept at this temperature for several days. The bars, in this way absorb the carbon from the charcoal. The carbonized bars (called "blister steel") are then cut into small pieces, remelted in a crucible, poured in ingots or rolled into bars.

The newer method is to melt small pieces of Norway or Swedish iron base with charcoal in a graphite or clay crucible. It is then poured into moulds and made into ingots, after which it is forged or rolled into bars.

The crucible process enables the steel to be made to almost exact analysis and insures a clean and pure material. It also absorbs the carbon much faster than steel made the old way.

In the school forge shop, the tool steel used should be of an inexpensive kind. High priced steel should not be used as more or less is wasted by the pupils in working. A carbon steel should be used for all forge shop tools. About 75 to 95 point is suitable. High-speed tool steel should be used only to give the pupils instruction in its handling and use, and to familiarize them with the different kinds of steel and their treatment.

To the steel maker, temper means the amount of carbon percentage in the steel. The word point means 1-100 of 10-0. For instance, 150 point means 150-100 of 10-0 of carbon in the steel. This is about as high as is generally made. One hundred and fifty point is known as high temper; low temper is about 40 point. Steel containing less than 40 point will not harden to advantage and would be classed with machinery steel. There is a range of tempers between high and low point which are used for different kinds of tools.

In the forge shop the term *temper* means the degree of hardness given to a piece of tool steel. As an example, a piece of steel is heated to a dark red and cooled in water or oil. This is called hardening. If this piece is too hard for the purpose it was intended, it is then tempered to reduce some of its hardness, and to give the steel elasticity and strength. In doing this, it is subjected to heat, (the more heat the softer the pieces become). In the forge shop in tempering steel, the metal is polished bright after hardening. If it is a small piece it is then held on or near a piece of hot iron. As the piece becomes heated, the steel heated in the air assumes colors; at first a very faint yellow and gradually darker, until all of the color has disappeared leaving the steel without any trace of hardness.

These different colors as they appear on the surface of hardened steel represent different degrees of hardness. The following simple list of colors applies to the different tools and carbon to use:

Light straw—430 degrees F. Lathe tools—130 point carbon.

Dark straw—470 degrees F. Taps and dies—120 point carbon.

Purple gray—530 degrees F. Chisels and blacksmiths' tools, 75 to 95 point carbon.

Of course there are other colors than these. As the heat advances every few degrees the color keeps changing to a darker one which makes the tool softer.

The hardening heat is about 1300 to 1400 degrees F., or a cherry red. About 400 degrees F. relieves the strain in a hardened piece of steel; 600 degrees leaves a trace of hardness and is about right for springs.

In further demonstrating hardening and tempering of tool steel, the making of a flat cold chisel will be considered. The principles involved are about the same in all hardening and tempering.

# INDUSTRIAL-ARTS MAGAZINE



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## EDITORIAL

### VOCATIONAL EDUCATION WITH THE EDUCATION LEFT OUT.

THERE is, in some states, a type of school which is legally called vocational but which lacks considerable of being educational. We refer to the state-aided evening schools in Massachusetts, Indiana, New Jersey and some other states. They are described in the state laws as follows: "'Evening class' in an industrial, agricultural, or household arts school *shall mean a class giving such training as can be taken by persons already employed during the working day,* and *which,* in order to be called vocational, *must,* in its instruction, *deal with the subject matter of the day employment and be so carried on as to relate to the day employment.*"

There can be only one interpretation to that definition. The training taken by persons in the evening class, if it is to be called vocational, must deal with subject matter of their day employment, and must be so carried on as to relate to their day employment. Let us see how this works out. John works all day as a sheet metal worker. He sees that there is not much ahead for him in that line of work. He wants to prepare himself to be a machinist, so he enters night school. The only classes he may enter are those dealing with sheet metal work. Mary is tired of picking chickens in the slaughter house. The pay is very low. She wants to learn typewriting and she is willing to attend night school after her hard day's work but the only classes open to her are those dealing with picking chickens or housemaking.

Various manufacturing associations have "working agreements" which provide that no member will employ operatives or help which leave the employ of another member, within a period of thirty days of the time of such leaving.

John, who does not like the work in sheet metal decides that since he cannot enter the classes in machine shop work in the night school unless his day work is in a machine shop, he will enter a machine shop, and so leaves his old employer. He must now remain idle for a month before he can secure work in the machine shop. If he cannot afford to loaf for this time, then he must go back to the sheet metal work.

Could it be possible that the same parties that drew up the working agreement for the manufacturers' organization, wrote the law governing evening class instruction?

Recently, in a city in one of the states mentioned, the Chamber of Commerce, co-operating with the school authorities, appointed a committee to investigate conditions in the industries, and to make recommendations concerning action to be taken, should they find that conditions demanded it. The investigation brought out the fact that the glass factories are employing a large number of boys to carry bottles from one part of the factory to another. These "glass house rats," as they are called, have no opportunity of advancement or of learning a trade.

The investigating committee recommended that these boys be taught some trade or skill which would enable them to get employment outside of the glass factory, and also recommended that night school courses be provided for this purpose. To assist them in planning such courses, the State Deputy in charge of Industrial Education was consulted. This gentleman informed them that the only courses in the night school for which they could obtain state aid were those dealing with the subject matter of glass and bottle manufacture, and furthermore that those boys under 17 could not attend night classes.

Thus the state in which this occurred becomes a party to retaining these "glass house rats" in their blind alley occupations. There is already agitation in one of these states to have its "Vocational Education Law" repealed.

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### TRUTH IN ART.

It is reported that at a recent exhibition of heirlooms in New York City, a cultured gentleman fell in a faint when suddenly confronted by a figure of the Venus of Melos in the middle of whose superb anatomy was set an open faced clock. Shattered ideals no less than shattered bones may prove fatal.

The exhibition in New York was of heirlooms gathered from good old New England families who prized them for their associations. It is a cheerful sign of the times that visitors to the collection could not appreciate them as heirlooms because of their incongruity in design. "A tea set decorated to commemorate a plague in Germany and ornamented with coffins, drooping cypresses and hearses disappearing toward suggested mausoleums" is not conducive to aesthetical appreciation however it may be interesting as an heirloom.

American industrial design has improved much since the eighties, but there is yet much room for improvement. Art teachers in the common schools may be credited with much of this improvement, and they are primarily responsible for greater improvement to come.

Art has application to industrial productions as well as to emotional expression thru natural form, but good taste does not allow the indiscriminate use of pictorial art in industrial design.

The impropriety of representing one material by another material needs constant emphasis in America where we are rather given to such deception. The well-trained English stonecutter, who was delighted with the extensive use of carved stone on his first visit to Amer-

ica, only to find on closer inspection that it was nothing but sanded tin, has our sympathy.

The editors of this magizine claim no ideals of art so vital and sensitive that sudden shocks may prove fatal, yet they are returning manuscripts, with thanks, that propose the incongruous and inconsistent association of forms in design. They have been criticized for one article that had passed censorship. This article described the production of stained glass effects in colored papers as a "school craft worth while." We would answer this criticism with the conviction that *it is the deception that makes a falsehood.*

The article in question did not propose to substitute paper for glass with a purpose to *deceive.* We hardly believe it possible to deceive by such methods.

It did propose to teachers that pupils might profitably study effects of harmony in transparencies by the use of colored papers, where the real material is not available, and so produce effects of use and beauty at little expense of money.

Can it be that the aesthetical standards of our critic are violated by school work in any material other than the materials of commercial use?

Such extreme standards would preclude much study of design now common in school practice which we believe is profitable and not deceptive.

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### CULTURAL VERSUS VOCATIONAL.

Dr. Bagley of the University of Illinois, in his address at the Richmond meeting, makes some distinctions and analyses which bring clearly to view some sound and wise propositions.

He divides education into *specific* and *general* education. The latter he subdivides into three types, namely, *fundamental* education, *liberal* education, and *cultural* education.

Of the first type, he says that it "comprises those habits, skills, knowledges, and ideals which must be made the common property of all." This type, as well as vocational education, he says, "prepares for situations which can be predicted with reasonable certainty."

The second, or *liberal* type of general education, according to Dr. Bagley, deals with *explanatory principles* which will "give the individual the possibility of a *rational control* over new situations, the precise nature of which we cannot foresee; but which we are morally certain will arise in his life."

Of the third, or *cultural* type of education, he says, "while the distinction between liberal education and cultural education should not be clearly drawn, I should think of the latter as essentially the education that prepares for leisure."

Some of Dr. Bagley's conclusions may be stated as follows: All forms of education are intimately connected and correlated. Every curriculum proposed for a boy or a girl should represent, in a fair proportion, each of these distinctive types of training. Intense specialization in vocational subjects is necessary, but no vocational curriculum should be so intense as to neglect the liberal or the cultural.

### STITCHES OUT OF TIME.

A Young lady from a northern city went into one of the mountainous districts of the South to teach cooking and sewing in a girls' school. A visitor saw a class of her seventh-grade girls learning various stitches by repeatedly making rows of them across small patches of cloth. The visitor inquired whether the girls might not be able to do some of their home sewing, such as making simple dresses or aprons. The teacher in surprise, said: "O, no, that work comes in the high school." Of course, not one girl in a hundred in that particular part of that particular state ever sees a high school or cares to see one.

This extreme case is an example of how a good many of us who claim to have seen the urgency of a sane and practical line of work for boys and girls, may after all, be bound down by abstract and impractical theory.

Teachers must break away from deadening routine and help to solve the real problems which the life of the community presents. In these, there are abundant opportunities to teach the stitches, joints, recipes, cuts, and welds which are essential to the different lines of work and to teach them in such a way as to make them do a real and needed service.

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### BY THEIR FRUITS.

Wherever Vocational Education is the subject for discussion, one may hear arguments for and against the unified and dual systems of administration. The advocates of the separate system claim that the present schools cannot give vocational training effectively, and the advocates of the unified system claim that they can. Every discussion leaves the problem as far from solution as before.

Every one concedes that there is absolutely no reason for establishing a new educational agency if the present one can do the work equally as well. The advocates of the separate system claim, and not without reason, that many of the persons now in control of school systems do not understand the situation and cannot meet it; that they are classically and educationally hidebound; and that it is not safe to intrust the administration of vocational education in their hands.

The question cannot remain undecided much longer. One or two states have the dual system and some others have the unified system. It would seem that in a short time, results would demonstrate the superiority of one of the schemes.

The only forcible argument in favor of the separate system exists within the present school system. If that is eliminated, there is no foundation to the argument. If the school authorities in Illinois and other states who favor the unified system will "get busy" and demonstrate that they do comprehend the situation and are capable of solving the problem, all statements to the contrary will be proven unfounded and the uselessness of another system will be apparent.

In those states which have the unified system, the persons who have assumed the responsibility of administering it have a duty to perform. They owe it to the profession as well as to themselves to accomplish something. They should realize that the unified system is on trial, and that they are responsible for the verdict.

# The Convention of the Eastern Art and Manual Training Teachers' Association, Atlantic City

Royal B. Farnum, Albany, N. Y.

THE annual interruption in the otherwise steady movement of the teacher's progress thru a strenuous year of incessant giving out of personality, energy and knowledge is a tonic when it consists of a trip to the Art and Manual Training Teachers' convention. After weeks of lessons and outlines the tired educator packs up and journeys to the meeting place realizing full well that the return will see him "worn to a shred" but knowing that for three days at least, he need give nothing, but instead may receive. This pleasant statement, of course, does not apply to the officers of the convention who are still bound to the rack until the final session.

For most of us, three things are to be gained from these annual meetings. We look forward to the meeting with old friends and new acquaintances; we seek inspiration in the carefully planned program and we anticipate with interest the exhibits, both educational and commercial.

Only those who annually indulge in this frolicsome recreation can appreciate what it means to board the train, walk down the aisle and meet again the familiar faces of last year. What an irresponsible lot we are! There is Cummings who lost the other fellows in New York and likewise his coat and bag for a proper night's rest. There is "Fritz" ready to talk on the latest phase of Art Education and deep in controversy in the rear of the car are Ball and King discussing the pros and cons of Short Unit Courses. Mr. and Mrs. Rose are smiling on one side carefree for the time being, and brave in her temporary loneliness on the opposite side sits little Miss Brown surrounded by raincoat, umbrella, bag and magazines.

The time passes quickly and after one more change to the hotel bus, all are shaking hands with the early comers at the headquarters. We hear that Mr. Perry is around somewhere, Mr. Garritt and some assistants are still hanging the exhibit, Miss Church has come on from Chicago, Newell's wife is with him and Mr. Bailey gets in tomorrow afternoon.

Of course the next day many more come in and the good time continues with all the latest news sifted and sorted and catalogued by night time. For this alone the convention is worth the price. But there are the other good things: the addresses, the round tables, the discussions and the exhibits.

The meeting of the Eastern Art and Manual Training Teachers' Association at Atlantic City, April 9th, 10th and 11th was, with one exception, common to the rule. This one exception was the fact that in no instance did a speaker fail to respond at the time he was scheduled. This guaranteed a full program and insured a profitable meeting. The genial and active president, Mr. T. D. Sensor, and his officers deserve much credit for this success.

One who attends the latest conventions on art and manual or industrial training is forcibly impressed with the feeling that Art, Home Economics, Industrial Training are all vitally related to each other and to any well organized educational system; that

> "All are needed by each one
> Nothing is good or fair alone."

Each year there is less of that spirit which seemed always to be trying to justify the existence of drawing and manual training. Recognizing the importance of it all, the modern educator seeks now to regulate it for the betterment of the boy or girl. This was interestingly discussed by Dr. Calvin N. Kendall, Commissioner of Education for New Jersey, the first speaker on the program at the opening session. That every boy or girl in our schools did not receive training in these branches is to be regretted, was the thought of Dr. Kendall.

Mr. Charles A. Prosser, who can talk anywhere on any subject, but best on Industrial Education, followed the first speaker. As Secretary of the National Society for the Promotion of Industrial Education, Mr. Prosser is in a position to know whereof he speaks and tho his address "How Far is Art a Factor in the Present Need for Industrial Education" struck deep in the mental mire of some belated art teachers, it sounded a keynote for the progressive supervisor and pointed the way for beauty in the industrial product. The training of appreciative consumers Mr. Prosser considered the chief purpose in art teaching, tho he was careful to point out that the training of the professional craftsman and artist should not be neglected.

The opening session concluded with an important announcement of the International Art Congress to be held at Paris in August, 1916. Mr. Royal B. Farnum, Chairman of the American Committee, stated that the efforts of the committee would be centered upon two things: A government appropriation for properly carrying out the United States program in the congress, and a strong exhibit made up of industrial and craft products as well as the customary flat drawings. The congress has come to mean a world gathering of leaders in Art and Industrial Education and the American Committee should be supported by our government to the extent, at least, of a proper representative exhibit of all phases of our work.

The morning session augured well for the rest of the meeting. Following hurried meals, came the round tables with topics and speakers as follows:

"Pre-vocational Schools. A Scheme of Education for the Motor Minded." Edward C. Emerson, Department of Manual Arts, Boston.

"Short Unit Courses in the Elementary Industrial School." Frank H. Ball, Director of Industrial Training, Pittsburgh, Pa.

"Training for Homemaking in Elementary Schools." Anna M. Cooley, Director, Household Arts Education, Teachers College, New York City.

"Opportunities for Vocational Training in Household Arts Courses." Mrs. Mary F. Marshall, William Penn High School, Philadelphia, Pa.

"What the Average Grade Teacher Can Accomplish in Blackboard Drawing." Morris Greenburg, Commercial High School, Brooklyn, N. Y.

"Standardization in Drawing." Jean Kimber, Art Instructor, State Normal School, Oswego, N. Y.

Perhaps the most important paper of the afternoon was that given by Miss Kimber on "Standardization in Drawing." After discussing the work of Dr. Thorndike, of Teachers College, along these same lines, as published in the Teachers College Record for November, 1913, she illustrated a plan of her own carried on at the Oswego Normal School and urged all present to look further into the matter. That some scheme must be devised for standardizing our work in drawing and manual training is apparent to the more thoughtful supervisors. Miss Kimber's paper threw much light upon a new matter and a committee was later appointed to develop the subject during the ensuing year.

The evening of the first day was given over to an address by Dr. James P. Haney, Director of Art in High Schools, New York City. Before a big gathering Dr. Haney told about his method of teaching very large classes of children at the Art Museum of New York. With many sketches and quotations from various sources, with pic-

tures in brown crayon and pictures in words, he instructed his audience for two hours and more; a full meal to be digested at leisure.

The second day of the convention was again filled with good things. Mr. Frederick G. Bonser, of Teachers College, New York, presented an admirable paper on "Vocational Guidance as an Opportunity for Teachers of the Practical Arts." Unfortunately his time was cut short with preliminary business, but enough was heard to cause all to ask for an early publication of the Proceedings.

Miss Emma M. Church, Director of the Chicago School of Applied and Normal Art, presented in her convincing way, an excellent paper on "The Conservation of Beauty in the Industrial Arts." She struck a much neglected note by suggesting that we seek beauty in our work thru spirit as the guiding principle. It is the spirit of the flower we must seek to put into the design as the Japanese express the spirit in their painting. All of Miss Church's discussion was well illustrated in the fine exhibit of her school's work.

"Pottery" was a helpful paper given by Mr. George C. Greener of the North Bennet Street Industrial School, Boston, Mass.

The afternoon of this second day was given over to a round table on "Terminology and Function of the Manual Arts" with Mr. Arthur W. Richards of the Ethical Culture School, New York, presiding. A printed "Manual Training Creed" was presented by the School Crafts Club of New York City and was the basis of long and heated discussion. This resulted later in the appointment of committees on Terminology and Salary in Manual Training.

The final addresses on the morning of the third day proved conclusively that the program committee had planned wisely. Mr. Frank E. Mathewson, Principal of the Technical and Industrial Department, Dickinson High School, Jersey City, N. J., revolutionized "Vocational Courses in the High School" and illustrated the work of the students in his school. Mr. Harry W. Jacobs, Director of Art Instruction, Buffalo, N. Y., spoke in his quiet way, on "The Supervisor as an Art Influence in the Community." That he practices what he preaches was shown in the illustrations of the work and methods he uses in creating such an influence. By means of exhibits, graded and mounted problems typical of school work and professional work, of his own, Mr. Jacobs proved the value of what he was saying.

The final speaker of the convention was Mr. Henry T. Bailey. On the topic "The Training of Taste Thru Printing" Mr. Bailey convinced all that he was an expert authority. Briefly, he stated that the first duty of the teacher of printing is to collect examples; the second to analyze these examples; the third to practice in the production of fine work. These steps were all illustrated by means of charts and blackboard sketches. "Printing," said Mr. Bailey in conclusion, "is pre-eminently the art of Democracy. As baskets were the commonest objects to the Indian, and so the chief subject of his art; as pottery served the early Greeks and became the characteristic art-craft product of their civilization; as common kitchen utensils of bronze became the fine art of the Romans; as armour and weapons called forth the utmost skill of the craftsmen of the middle ages; so printed things are destined to become characteristic of our American life. Five hundred years hence museums may cherish examples of our Christmas cards, as we now cherish Tanagra figurines! Printing has yet to come to its own as an art. The high tide is yet to be. Meanwhile it stands at our call as the best single instrument available for training the taste of our boys and girls."

A convention without exhibits is like an address without illustration. We may stand it a while, but not for long. We need tangible assistance. And, moreover, we like first to see what others are doing, and second, to find out where we stand ourselves. Then again we like to see what the commercial houses have to present for our help in teaching. Perhaps a few like to get those samples which are always so unexpected! The grammar school, connected by a covered walk with the high school in which all the meetings were held, was given up to exhibits. School work was exhibited in the classrooms on the walls, on screens and in the corridors; commercial exhibits were placed in the school gymnasium on the first floor. A wide territory was represented by small comprehensive exhibits of school drawing including grades, high schools and professional schools.

HARRY W. JACOBS,
President-elect Eastern Art and Manual Training Teachers' Association, Buffalo, N. Y.

A general spirit of good fellowship lent a wholesome atmosphere to the whole meeting. At the exhibits the same spirit prevailed and teachers appeared to seek for new ideas and help in their own work rather than for subjects for sceptical criticism. Not in the spirit of the poem:

I met a little Elfman once
Down where the lilies blow;
I asked him why he was so small,
And why he didn't grow.
He slightly frowned and with his eyes
He looked me thru and thru,
"I am as big for me," said he,
"As you are big for you."

But with more kindly grace each exhibit was given careful attention for it was recognized that every "Elfman" as well as supervisor filled a big and special need in a particular place.

The Atlantic City Convention, with all its successful achievement, bids fair to be repeated under the new president, Mr. Harry W. Jacobs, Director of Art Instruction, in Buffalo, N. Y., where we hope to meet again in 1915.

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STUDENTS of the Manual Arts Department of the Kern County, Cal., high school have completed a greenhouse at the school farm. The building is 35 feet by 60 feet, contains 2,000 panes of glass and the work from start to finish has been done by the students. First-year boys in woodworking did the figuring for materials, the excavating and the construction of the foundation, built the frame, put in the glass and did the painting; those from the metal shop did the plumbing and installed the machinery.

# THE MILWAUKEE MEETING

## Western Drawing and Manual Training Association

S. J. Vaughn, De Kalb, Ill.

THE twenty-first annual meeting of the Western Drawing and Manual Training Association was held in Milwaukee, Wis., May 6 to 9. The general topic of discussion was "A Casting of Accounts Educationally, of the Fine and Industrial Arts."

The Association was formally welcomed to Milwaukee by the President of the Board of Education, Mr. G. W. Augustyn, and by the Superintendent of Schools, Mr. Milton C. Potter, and our subsequent royal entertainment proved conclusively that our welcome was not a mere formality. When Mr. Selvidge, our president, had responded in his happy fashion to the welcome and had delivered his splendid address, the meeting was on in full swing.

In many ways, this meeting surpassed all the previous meetings of the organization. Some of the points of superiority were the strong program, the large membership, and the excellent financial status of the treasury.

All the speakers were present and the various numbers were carried out as planned. The general sessions presented addresses by the following well known people: President Carroll G. Pearse of the Milwaukee State Normal School; President H. H. Seerley, State Teachers College, Cedar Falls, Iowa; Mr. Dudley Crafts Watson, Director Milwaukee Arts society; President L. D. Harvey, Stout Institute; Mr. E. J. Lake, Head of the Art Department, University of Illinois, and Miss Katherine E. Dopp, University of Chicago.

Many strong papers were given in the Round Tables by such people as Miss Fitch of Indianapolis, Miss Henke of Muskegon, Miss Blanchar of the Milwaukee Girls' School of Trades, Mr. Hicks of Madison, Mr. Henderson of Hammond, Ind., Mr. Bennett of Peoria and others. Many interesting and lively discussions were participated in by the leading school men and women of the Middle West.

One feature of one of the evening programs was in the nature of brief memorials to the lives and work of Miss Wilhelmina Seegmiller and Dr. Calvin M. Woodward, deceased members of the Association. Mr. Perry of the Pratt Institute spoke of the life and work of Miss Seegmiller, and Mr. Chas. A. Bennett spoke in honor of Dr. Woodward.

The educational exhibits, always an important feature of the meetings of the Western Drawing and Manual Training Association, were of unusual number, size and excellence. The Milwaukee schools made an extensive exhibit of all lines of their work. The Trade School for Boys made a remarkable showing as did also the Girls' School of Trades. In this exhibit was shown a complete, good sized cottage with high-grade interior woodwork, including built-in furniture.

Besides the exhibits of the local schools, there were large and excellent exhibits from St. Louis, Stout Institute, the Chicago Art Schools, Grand Rapids, Minneapolis, Cincinnati, the University of Wisconsin, Hackley Manual Training School and numerous other places. The richness of these exhibits in suggestions and in standards and quality of workmanship, amply justified the liberal time allotted to the study of the exhibits.

The educational exhibition, which occupied the entire arena and stage of that mammoth Auditorium, was surrounded on all sides by booths in which the commercial firms made exhibits of their wares. Exactly 37 firms were represented in this exhibition and made the finest display of machinery, tools, supplies, and art and domestic-science goods ever shown at a meeting of the Association.

Another matter which added greatly to the pleasure and profit of the occasion, was the meeting of the Wisconsin School Arts and Home Economics Association in conjunction with the Western Drawing and Manual Training Association.

Mr. Jacobs of Buffalo, N. Y., the president of the Eastern Drawing and Manual Training Association,

A CORNER OF THE EXHIBIT.

A PORTION OF THE DISPLAY OF STOUT INSTITUTE.

brought the greetings from his organization and extended a cordial invitation to the members of the Western Association to meet with them at Buffalo next year.

The hospitality of the Milwaukee people could not have been surpassed in the handling of the Association. The magnificent and commodious Auditorium which was placed at the disposal of the organization, housed in a convenient and perfectly comfortable way, all the exhibits both educational and commercial, and all the meetings of the entire program.

Members of the Association always look forward to the banquet on the first evening of the meeting. The banquet was splendidly handled and delightfully carried out. The local school people pressed Mr. Frank M. Bruce into service as Master of Ceremonies, and he did the honors in his happy and business like way. The extemporaneous "one minute" speeches which he called for, were responded to in a delightfully crisp and brief manner by people from New York to Oregon and from Massachusetts to New Zealand.

Following the banquet were entertainment features which alone made the Milwaukee meeting memorable. Dramatic scenes from the life of Bluebeard, somewhat modernized, Scottish and German songs, exquisite rendering of fancy dances, displays by living models of fashions in dress, commented upon in artistic phraseology, and futuristic exhibits of work in Domestic Science, were some of the real joys of the occasion. For these splendid performances, the Association will always feel indebted to Mr. Dudley Crafts Watson of the Milwaukee Art Society, the special teachers of Art, Manual Training and Domestic Science in the Milwaukee Public Schools, the State Normal School, Milwaukee Downer College and the Girls' Trade School.

The music and folk dancing provided by the pupils of the Milwaukee schools were very superior, indeed, and excited much comment.

Not the least enjoyable part of the four days' meeting was the opportunity to see the splendid city of Milwaukee and its excellent schools, colleges, and other institutions. These pleasant and profitable excursions were made possible thru the courtesy of the local committees who provided fifty automobiles for our pleasure.

Much credit for the success of the meeting is due to Mr. Selvidge of Peabody College, Nashville, President of the Association. In the matter of the program, both in the quality of the speakers and in the financial management, Mr. Ira S. Griffith of the University of Missouri, chairman of the program committee, deserves the special thanks of the entire organization. But without the heroic efforts of Miss Emily Dorn, Supervisor of Art, Milwaukee, who enlisted the support of hosts of enthusiastic workers, the meeting could not have been so eminently successful.

Chicago was chosen as the meeting place for next year.

The officers for the succeeding year are as follows:

*President*—Miss Florence Fitch, Supervisor of Art, Indianapolis.

*Vice-President*—Miss Ora Blanchar, Principal Girls' School of Trades, Milwaukee.

*Secretary*—Wilson H. Henderson, Director Vocational Schools, Hammond, Ind.

*Treasurer*—L. W. Wahlstrom, Francis Parker School, Chicago.

*Auditor*—Miss Vandaline Henkel, St. Louis.

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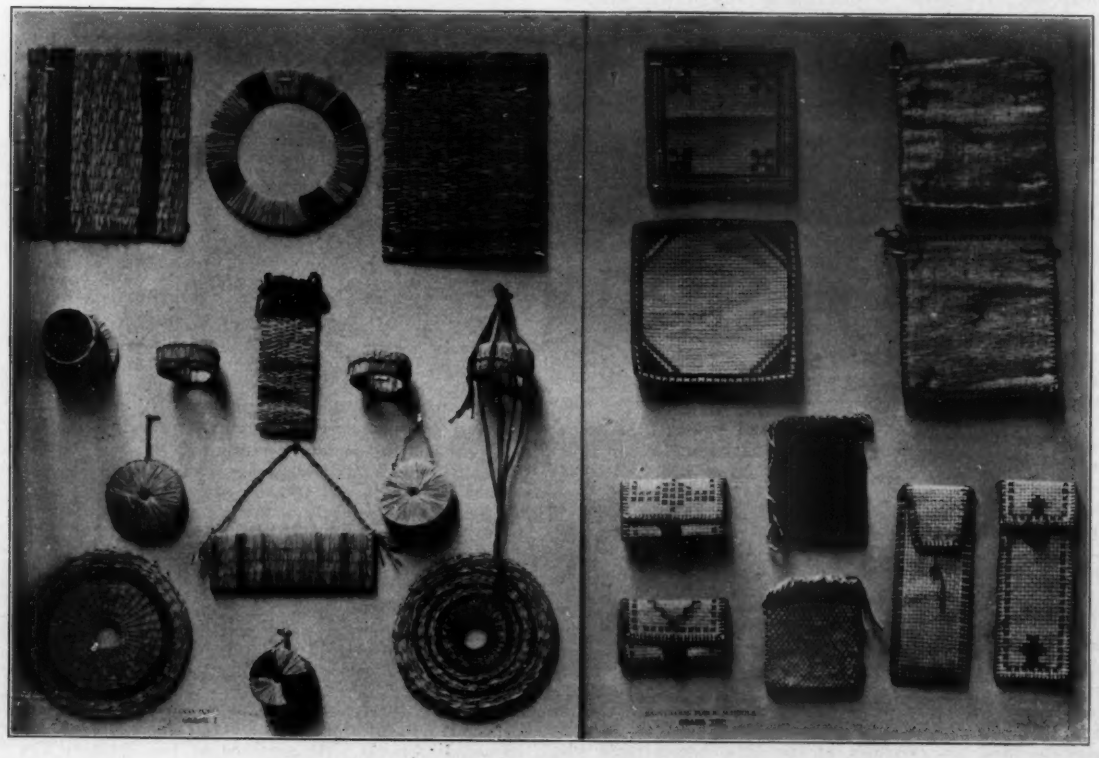
JOHNSTOWN, PA. Evening classes for wage earners providing training of assistance to the shopman, have been opened. The classes began with commercial and language courses, but additional studies along technical lines will be provided upon a sufficient demand.

RED LAKE FALLS, MINN. A short course for farm boys and girls has been begun by the state high school. The work covers a period of twelve weeks, ending in March of the present year.

WAUSAU, WIS. An Industrial school has been established in the city hall with accommodations for Manual Training, Domestic Science and architectural classes.

NEW LONDON, CONN. A Cooking class has been formed by the pupils of the Hale grammar school and the local parochial schools with sessions at the Manual Training School.

General View of the Exhibit, Western Drawing and Manual Training Teachers' Association, Milwaukee, May 6-9.



Two Cards of the Interesting Exhibit of the St. Louis Schools.

# BRIEF ITEMS OF INTEREST

## NEW DEPARTURE IN VOCATIONAL EDUCATION IN MASSACHUSETTS.

HOUSE BILL No. 327, which provides for the training of teachers for State-aided vocational and continuation schools, has been enacted as chapter 174 of the Acts of 1914. Under the provisions of this act it is planned to enter upon the training of teachers in accordance with proposals submitted in detail in the 77th annual report of the board of education. The following are the reasons for and the essential features of this proposed scheme:

There exist in Massachusetts at the present time no agencies, the controlling purpose of which is to train teachers for State-aided industrial schools. It has been necessary to procure as teachers persons who had indirectly qualified themselves in a degree for this work, either in schools or thru the pursuit of their trades or other vocations. If vocational education is to receive proper encouragement, agencies must be created, the primary function of which shall be the training of teachers for what is, in all essential respects, a new form of public education.

The Massachusetts Agricultural College may be expected to offer courses sufficiently complete and practical to insure that approved graduates therefrom will be qualified to undertake teaching in agricultural secondary schools.

It is possible, also, that existing private agencies, such as Simmons College and the Women's Educational and Industrial Union, may be able to give the combined practical and technical training necessary for those who are to teach in girls' trade schools and day and evening schools of household arts. But it is now evident that existing manual training schools and technical schools are not in a position to give satisfactory training to prospective trades and industrial teachers.

Under conditions as they now exist it seems undesirable and impracticable to organize a school for the training of vocational teachers which shall admit as students inexperienced young people who have had as previous preparation only instruction in the regular public schools. It is for this reason that the board does not find it expedient to use an existing normal school for the purpose of training vocational school teachers, even if available facilities of these schools were not already fully preempted in doing the work for which they were organized.

It does not seem practicable to found in any part of the state a separate training school for industrial teachers. The proposed plan is to establish, with state aid, evening classes wherein young mechanics, and others who have already served an apprenticeship in their respective callings, can receive such specific and practical training in methods of teaching and class management as will in a measure qualify them to become teachers. It is highly probable that such evening classes, properly conducted, and open only to carefully selected students, will give young men in one or two years sufficient insight into right methods of teaching so that they can render fairly effective service as teachers, provided their training as workmen has been satisfactory.

It is intended to provide further means toward such training by creating, in existing vocational schools, assistantships, with small salaries attached thereto. In these positions the candidates can, while giving assistance to teachers, take special courses in methods of teaching and class management by means of which they also will within a short period become qualified to render good service.

In the various large industrial centers found in Massachusetts it should not prove difficult to attract to the evening classes proposed above, and to assistantships, young trades workers who possess something of an instinct for teaching.

It is proposed to establish evening classes and assistantships in the larger industrial schools of the state, notably those in Boston, Worcester, Springfield, Lowell and New Bedford. Possibly good opportunities will be found also in other communities. In the course of a few years it is hoped that graduates of these industrial schools, having had some practical experience, will return and undertake to qualify themselves to become teachers.

For purposes of instruction it is intended to utilize, where practicable, the buildings and equipment of existing industrial schools, and also the services, in part, of members of the teaching staff. The courses established will be designed not merely for persons seeking to become teachers, but also for persons now serving as teachers who desire further instruction with their work.

For the present it is contemplated that the evening courses proposed shall be carried on for the same length of time each year as regular evening school industrial courses, namely, two sessions every week for twenty weeks, each session being about two hours in length.

## THE TOASTOVE.

THE boys of the Irwin Avenue Industrial School of Pittsburgh, Pa., have invented and are manufacturing an electric stove or toaster which they are calling the "toastove." After considerable experimentation they have found a suitable heat element and filler which gives a maximum of heat with a minimum of current. The metal part of the stove is sheet copper, polished and lacquered. The "toastoves" are being manufactured in the school and sold at a profit.

In a booklet, which is printed in the printing department of the same school, the project is fully described together with drawings and photographs. Mr. Frank Ball, Director of Industrial Education, has a limited supply of these booklets which he will send to interested parties.

## VOCATIONAL GUIDANCE SHOWN IN EXHIBITION.

A display of charts and card forms on the subject of vocational education and guidance for children was on exhibition recently in the pedagogical library of the board of education at Philadelphia, Pa.

The exhibit was collected and arranged by the Public Education Association and included material from New York, Boston, Pittsburgh, Brooklyn, Cincinnati and other cities, in addition to a large number of charts showing the progress of vocational guidance in the city of Brotherly Love.

The exhibit portrayed facts in regard to the young workers who go out from our schools to enter industrial occupations. One chart showed, in picturesque form, that nearly one-half of the 14 to 16-year-old children employed in the city of Philadelphia are in factories, averaging about $4 per week.

## COUNTRY BOYS' CREED FOR YOUNG VIRGINIA FARMERS.

In every schoolhouse in Prince Edward County, Va., a placard containing a creed for the American country boy and dedicated to the Boys' Corn Club of Virginia has been posted. It reads:

"COUNTRY BOYS' CREED.

"I believe that the country which God made is more beautiful than the city which man made; that life out of doors and in touch with the earth is the natural life of man. I believe that work with nature is more inspiring than work with the most intricate machinery. I believe that the dignity of labor depends not on what you do, but how you do it; that opportunity comes to a boy on the farm as often as to a boy in the city; that life

is larger and freer and happier on the farm than in the town; that my success depends not upon my location, but upon myself; not upon my dreams, but upon what I actually do; not upon luck, but upon pluck. I believe in working when you work and in playing when you play, and in giving and demanding a square deal in every act of life."

### APPOINTS VOCATIONAL COMMISSION.

THE appointment of a vocational commission to adopt plans for making vocational training an integral part of the school system of the state of Washington was announced on April 11th by Mrs. Josephine Preston, State Superintendent of Instruction.

The members of the commission include:

H. G. Lull, professor of education, University of Washington; Professor F. O. Kreager, head of the elementary science department, Washington State College; Ben W. Johnson, director of manual training in the Seattle schools; Miss Len Kohne, Island County superintendent of schools; W. M. Kern, city superintendent, Walla Walla.

An advisory board of 60 men and women from all sections of the state has been named by Mrs. Preston to assist the commission and to give it not only moral support but to engage actively in a survey of the state. The commission and the advisory board will hold a general session at Olympia on June 24th. After working out a plan of action, the commission will submit its conclusions to the advisory board in October during the convention of the State Teachers' Association.

Among the conditions which led Mrs. Preston to appoint the commission is the minimum wage act which is seriously affecting industrial affairs. Owners of mercantile and manufacturing establishments object to employing "green hands" at wages paid to experienced saleswomen and factory operatives.

### CHILD LABOR.

"WE have allowed ourselves to be deluded because our manufacturers have said things were all right, and we have respect for men of influence and wealth. If we have cried out against the bad rich, it has been because, in our opinions, most of the bad rich live next to Wall Street. To appoint an inspector for our own mill villages would be a reflection upon the word and character of good men!

"But, above all, the reason child labor continues is that the manufacturer wants the child in his mill. Since he considers child labor of such vital importance that he is willing to go to the legislature to fight for the right to work a child, you need not be surprised that we still permit a large percentage of our children to be taken from school and placed at work, and that on any work day in the cotton mills, week in and week out, hundreds of girls in short dresses may be found standing eleven hours."

*Wiley H. Swift of Greensboro, N. C.*

At recent meeting of National Child Labor Conference in New Orleans.

# NEWS AND NOTES

A REPORT of the sub-committee on Vocational Guidance, submitted to the New York City board of education, condemns the existing system in the public schools thru which pupils under 16 years of age are placed in employment. It is the belief of the committee that the work of finding employment should be discontinued as undemocratic and that the expenditures of public money for this work should cease. It is suggested that the board of education appoint a committee to work, in conjunction with a similar committee of the Board of Estimates, for the purpose of conducting a thoro vocational survey and devising the best means for finding employment for children who have reached an age when they may leave school.

SUPT. CHARLES S. FOOS, of Reading, Pa., has made plans for the establishment of a vocational bureau in the near future.

SPRINGFIELD, MASS. The school board has appropriated a part of the evening school funds toward the establishment of a continuation school to be opened in the fall. The instruction offered will not aim to teach the process of industry, but will be supplementary to the occupation of the pupil. Mechanical drawing, business correspondence and mathematics will be offered.

THE April number of "The Call of the Moose," the official publication of the Loyal Order of Moose, is devoted largely to the subject of Vocational Education, and to the new school which is being built at Mooseheart, Ill.

SALEM, ORE. According to State Superintendent Churchill, the results of the public school industrial clubs the past year have been far better than what had been expected. Up to the present time 4,363 pupils have been received at the rate of 150 a day.

The ten subjects in which the school children may compete for prizes, the names and the number of pupils enrolled, are as follows:

Canning and preserving, 374; cooking and baking, 563; dairy herd record, 36; corn raising, 383; manual arts, 266; pig raising, 151; potatoes, 296; poultry, 472; sewing, 1,045; vegetable gardening, 777; total, 4,363.

"When we stop to think," said Mr. Churchill, "that most of our school-girls will be housekeepers in a few years, and half of our boys will be farmers, the value of this industrial work can readily be appreciated."

AN opinion of the City Solicitor of Fitchburg, Mass., is to the effect that the city will be compelled to pay the tuition of pupils taking vocational courses at the trade school in Worcester, the state to refund half of the tuition charges. The charges cannot be legally paid out of the school appropriation and a special appropriation covered by the order is necessary.

THE HOME ECONOMICS DEPARTMENT of the Potlatch, Ida., schools has during the past year, served lunches to teachers and pupils in the schools. The children's lunches are served by the girls of the upper grammar grades at the small cost of ten cents per week. The teachers' lunches are prepared and served by the girls of the high school, working in groups of three. Each group is responsible for the work and is expected to buy material, cook and serve the food within the amount allowed for the week. The plan was originated by Supt. F. E. Lukens and has proven exceedingly practical in its operation.

THE WORCESTER SCHOOL of Trades arranged for a three-day conference on Industrial Education to be held May 21-22-23-24. General problems of Industrial Education as related to the city of Worcester; were discussed.

THE TWENTY-SIXTH EDUCATIONAL CONFERENCE of the Academies and High Schools in Relations with the University of Chicago, was held at the University, Friday and Saturday, April 17th and 18th. The general subject for discussion in the Manual Arts section was the literature of the subject. The speakers were A. G. Bauersfield of the Lane Technical High School, Jesse B. Davis, Vocational Director of Grand Rapids, and H. M. Appleman of the South Bend High School.

SACRAMENTO, CAL. The Manual Training Division of the high school opens May first under the direction of Mr. C. D. Webster who has been employed to supervise the vocational activities.

MOLINE, ILL. Two gasoline engines have been constructed by students in the shop department of the Manual Arts School.

A course in household economics has been put into operation in the high school at Alameda, Cal., by Miss Lucy Hewett.

THE school authorities of Knoxville, Tenn., are planning to erect a new Manual Training and Domestic Science building for the accommodation of the high school.

PORT HURON, MICH. Household chemistry has been added to the high-school curriculum providing instruction on the detection of impurities in foods.

NEW YORK, N. Y. Permission has been given for the opening of an industrial school in Public School No. 162 for the girls of the seventh-year grade.

PENNVILLE, IND. Agriculture and Sewing have been added to the high-school course. Girls who are not in regular attendance, may upon application, be admitted to the classes in Sewing.

OLEAN, N. Y. The industrial department of the high school has just added a ten-horsepower motor to its equipment, in place of the gas engine formerly used, thus doing away with much noise and inconvenience.

A new plan of work has just been inaugurated; namely, the introduction of vocational work during the first third of each term, during which time the pupils make, in a manner approaching shop conditions, articles of furniture and other equipment for use in the schools. At the close of this period, the pupils are allowed to make articles of furniture for themselves, the cost of the materials being paid by the maker.

The Chamber of Commerce has appointed a committee for the making of an industrial survey of the city, and plans for a machine shop have been made, which it is hoped, will materialize in the not far distant future.

THE inauguration of manual arts' courses in the public schools of Salem, O., has proven a success despite the fact that the work has been in operation only a few months. The boys' instruction includes woodworking, while the girls are given the rudiments in sewing. The work is limited to the seventh and eighth grades and freshmen in the high school.

KEOSAUQUA, IA. A Domestic Science department has been established in the high school.

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# BOOK REVIEWS

**Twelve Great Paintings.**

By Henry Turner Bailey. 63 pages. The Prang Co., New York.

An appreciative study of twelve masterpieces of painting in which Mr. Bailey emphasizes much of historical and literary interest and reflects his own keen, aesthetical insight. The paintings considered in the text are:

I. Pope Innocent X; Velasquez.
II. Spring; Corot.
III. Ulysses Deriding Polyphemus; Turner.
IV. Creation of Man; Michelangelo.
V. Saint Barbara; Palma Vecchio.
VI. The Mother; Whistler.
VII. Judith and the Head of Holfernes; Botticelli.
VIII. The Golden Stairs; Burne-Jones.
IX. The Sistine Madonna; Raphael.
X. The Transfiguration; Raphael.
XI. The Assumption; Titian.
XII. Pieta; Titian.

**The School and the Start in Life.**

By Meyer Bloomfield, Director of the Vocation Bureau, Boston.

Bulletin No. 4, 1914. United States Bureau of Education. 146 pages. A detailed study of the relation between school and employment in England, Scotland and Germany. It explains the methods of guiding young persons both before and after entering the industrial world, in Liverpool, London, Birmingham, Glasgow, Edinburgh and in Germany, together with a history of the development of these methods.

Every person interested in Vocational Guidance will welcome this interesting and instructive report, with its wealth of information.

**The Massachusetts Home-Project Plan of Vocational Agricultural Education.**

By R. W. Stimson, Agent, Massachusetts Board of Education. Bulletin No. 8, 1914, United States Bureau of Education. 104 pages, illustrated. A very complete report of a very suggestive system of projects. Teachers in Rural schools of any character would do well to secure this bulletin.

**Perspective Drawing.**

Forty-four pages. Price, 25 cents. The Prang Company, New York, Chicago, Boston.

A statement of methods of teaching freehand and mechanical perspective with illustrations and principles. The freehand drawing of type forms, interior and exterior views including buildings in parallel and oblique perspective are explained and illustrated. The mechanical development of perspectives by projection from the plans and elevations is described and illustrated so that high-school teachers of drawing may use the book as a class text.

**How to Visit the Great Picture Galleries.**

By Esther Singleton. 492 pages. The Prang Co., New York, N. Y.

This book is a handy reference for the tourist with little of personal criticism by the author and much of instructive information concerning the most important paintings of the European galleries.

Just such a reference as the tourist needs in short visits to the galleries when it is imperative to find the best works quickly and to understand the import of them thru a brief, authentic reference.

This volume describes the greatest masterpieces of the 21 greatest galleries of Europe in concise and authoritative statements with numerous references and illustrations. It should accompany every teacher-tourist on a summer tour.

**Constant and Variable Occupations and Their Bearing on Problems of Vocational Education.**

By Leonard P. Ayres. Division of Education, Russell Sage Foundation, 130 East 22d St., New York City.

This is a brief report of a recent study of constant and variable occupations and their bearing on the problems of vocational education. The investigation is based on the fact that there are some occupations which are common to all communities and which we may term "constant occupations." There are others which are found in some localities but not in others and these we may term "variable occupations."

The facts reviewed in the report throw additional light on some important characteristics of occupations which employ a considerable majority of all the wage earners in our largest cities.

**Proceedings of the Seventh Annual Meeting, National Society for the Promotion of Industrial Education.**

Bulletin No. 18.

**Report on the Selection and Training of Teachers for State-Aided Industrial Schools for Boys and Men.**

Bulletin No. 19, National Society for the Promotion of Industrial Education.

**Poultry House Construction.**

By Alfred R. Lee, Junior Animal Husbandman in Poultry Investigations. Farmers' Bulletin No. 574, United States Department of Agriculture. 20 pages, illustrated. Gives detailed drawings for the construction of poultry houses and yards.

# NOW, ARE THERE ANY QUESTIONS?

*Readers are urged to ask questions concerning the Industrial Arts. The editors will reply to those questions which they feel that they can answer, and to other questions, they will obtain replies from persons who can answer them authoritatively. Questions should be addressed to THE EDITORS.*

### Manual Training Course.

*Highland Park, Ia.* Q:—Thru your question department, I wish you would publish, or refer me to a place where I can secure a model course of study for Manual Training in Grades one to twelve inclusive.

A:—The most complete Course of Study in Manual Training which I have seen is that one published by the Illinois Manual Arts Association. The issue may be exhausted. A letter addressed to C. E. Lang, Secretary, 4129 Twenty-first Street, Chicago, will bring you this information—*W. H. H.*

### Trueing Grindstone.

Q:—*L. E. C.* asks for a simple method of trueing the cutting surface of a grind stone.

A:—Take a piece of gas pipe two or three feet long. Rest it on the frame of the stone so that one end of the pipe is in contact with the grinding surface of the stone. Turn the stone towards the pipe, holding the pipe in very much the same manner that you do a chisel on the rest of a lathe, using the frame of the stone as the rest. Roll the pipe back and forth across the rest, allowing the end to cut away the surface of the stone. This should be done whenever the stone becomes grooved or unevenly worn.

An emery dresser may be purchased for fifty cents or less. It will cut a little faster than a pipe, but is not so easily handled.

### Staining Oak.

*I. I. S. Minnesota.* Q:—I wish that you could let me know, thru your magazine, how to mix a good penetrating stain for red oak. I have tried many commercial stains, but there do not seem to be any that have the real penetrating quality.

A:—Note the directions for fuming oak in this column of the *March* number. This one gives a rich brown color: Put a handful of iron filings into a pint of vinegar or dilute sulphuric acid. After two hours dilute with water and apply to the oak with a sponge. Repeat the application if this does not give you the desired shade. You will find that this mixture will penetrate. It will also raise the grain of the oak which will require sandpapering after it dries.

Potassium bichromate, dissolved in cold water will produce a color similar to that obtained by ammonia fumes. In Germany, cabinet-makers often use strong coffee for darkening oak.—*W. H. H.*

### Green Gem Stones.

*Hastings, Neb.* Q:—Can you tell me the names of some green stones in common use? Where can I buy them?

A:—There are a great many green gem stones, but the following are common, very desirable, and moderate in price: Bloodstone, Malachite, Chinese Jade, New Zealand Jade, and Chalcedony.

Espositer, Varni Co., 49 John Street, New York City, are reliable dealers and are glad to send collections of stones from which to select.—*S. J. V.*

### Glueing Belting.

*Chicago, Ill.* Q:—I would like to know thru the question columns how to glue leather belting so as to do away with lacing.

A:—Common glue prepared with vinegar in place of water is used. The ends of belt are prepared for splicing by planing them with a wood plane, giving them a long tapered end. Glue is then put on both pieces. A couple of small tacks are driven in to hold them. The ends are then clamped together with hand screws, having a board each side of the leather. When the glue is hard the belt is ready for use. If the belt is a large one it should also be sewed.—*M. W.*

### Architectural Drawing.

*New York, N. Y.* Q:—At the bottom of page 184, in the May number of the *Industrial-Arts Magazine*, is this statement: "For this purpose, there should always be at least one return," etc. What is meant by a return in a joint of this character?

A:—Where materials are jointed in building construction the junction should not be *direct* from the outside to the inside of the building, even tho tightly nailed. In other words, one piece should not be merely butted against another, allowing a direct crack thru from exterior to interior.

The passage of air and moisture should be avoided by *housing* one piece into another.

Outside window stops are *housed* (set in a groove) into the frame.

Siding is *housed* into the sill, etc.

Such a *return* is made also when materials of different kinds meet in a wall as when an exposed chimney runs up thru a frame house. A projection should be built on the chimney thru its entire heighth over which the sheathing and siding projects to meet the exposed stack, thus giving a *return* junction to prevent the passage of air and moisture. This should be done in addition to flashing.—*E. J. L.*

### Textbook on High-School or Architectural Drawing.

*Batavia, Ill.* Q:—Can you advise me of a good text suitable for high-school or architectural drawing?

A:—No text on architectural drawing, suitable for any or all high schools, has come to our attention. The subject is a new one in high schools and covers such a wide field that it is probably best to arrange work most suitable to the needs and conditions of pupils in any given community.

It seems agreed among those teachers who have expressed themselves, that architectural drawing should be preceded by at least one year of mechanical drawing. It seems also agreed that architecture cannot be studied in high schools beyond the design and drawing of details in wood, stone, brick and concrete with a view of giving general understanding of house design and skill in preparing working drawings for small country and city homes.

The division of sentiment lies between the specific preparation of a draftsman for office work and the general educational value of a study of home and civic design.

The ideal course would include both of these. Good references on building construction and architectural drawing may be obtained from the Radford Architectural Company, Chicago, Ill.—*E. J. L.*

### Banana Oil.

*D. W., Glasgow, Scotland.* Q:—What is banana oil, mentioned by Miss Martha Feller King in her article on "An Etched Brass Desk Set?"

A:—Briefly, banana oil is so named on account of the odor imparted by the amyl acetate which it contains. The material is used quite commonly in the paint industries of the United States, particularly as the liquid constituent of bronzing paints. It is also sold by most art dealers for finishing cheap gilt picture frames.

The substance seems to have no definite formulas but varies in composition according to the ideas of those who prepare it. According to the Scientific American Book of Formulas, which is the most reliable source of information, banana oil usually is a mixture of equal parts of amyl acetate, acetone and benzine with sufficient pyroxylin dissolved in it to give the finished product sufficient body and to leave a protective covering after the liquids have evaporated.

A spurious oil is sometimes sold consisting of a solution of one gram of celluloid in 25 c.c. of amyl acetate. This "oil" and its vapor are highly inflammable and dangerous.

We have been unable to learn what the ordinary trade name of banana oil is as this substance is used in England and on the continent. Even the best American libraries of reference are "short" on European reference material in the English language altho French and German works are quite common.

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SOUTHBRIDGE, MASS. An industrial course has been inaugurated at the high school with an initial attendance of 22 students. The course is four years in length; the first year is devoted to academic studies and the last three to shop and school co-operatively. Students who take the course are paid at the rate of ten cents per hour for the first year; for the second year eleven cents per hour and the third year twelve-and-one-half cents per hour or a total of $552.75 for the entire three years. The wages paid make the boys self supporting.